



**Avaya Call Management System**  
Sun Fire V880/V890 Computer  
Hardware Installation, Maintenance, and  
Troubleshooting

07-600965  
May 2006

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200 Ward Hill Avenue  
Haverhill, MA 01835 USA  
Attention: Avaya Account Manager

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**E-mail:** [totalware@gwsml.com](mailto:totalware@gwsml.com)

**Order:** Document No. 07-600965  
May 2006

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#### Avaya support

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<http://www.avaya.com/support>

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# Preface

Avaya Call Management System (CMS) is an application for businesses and organizations that use Avaya communication servers to process large volumes of telephone calls using the Automatic Call Distribution (ACD) feature. Avaya CMS supports solutions for routing and agent selection, multi-site contact centers, remote agents, reporting, interfaces to other systems, workforce management, desktop applications, system recovery, and quality monitoring.

Avaya CMS is part of the Operational Effectiveness solution of the Avaya Customer Interaction Suite.

This section includes the following topics:

- [Purpose](#) on page 9
- [Intended users](#) on page 10
- [Overview](#) on page 10
- [Conventions and terminology](#) on page 11
- [Reasons for reissue](#) on page 12
- [Related documentation](#) on page 14
- [Support](#) on page 18

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## Purpose

*Avaya Call Management System Sun Fire V880/V890 Computer Hardware Installation, Maintenance, and Troubleshooting* is written for technicians who install and maintain call center applications such as Avaya Call Management System (CMS).

**Note:**

The Sun Fire V880 computer is compatible with CMS R3V11 and later. The Sun Fire V890 computer is compatible with CMS R13 and later.

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## Intended users

This document is written for:

- Avaya support personnel
- Avaya factory personnel
- Contact center administrators

Users of this document must be familiar with Avaya CMS and the Solaris operating system.

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## Overview

This document is organized as follows:

- [Installation](#) on page 19 - Describes how to assemble the computer, connect external devices, and turn on the computer.
- [Maintenance](#) on page 49 - Describes how to maintain the computer.
- [Troubleshooting](#) on page 149 - Describes how to troubleshoot the computer.
- [Glossary](#) on page 203
- [Index](#) on page 205

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## Conventions and terminology

Unless noted otherwise, the phrase "Sun Fire" used in this document applies to both the Sun Fire V880 computer and the Sun Fire V890 computer.

If you see any of the following safety labels in this document, take careful note of the information presented.

**CAUTION:**

Caution statements call attention to situations that can result in harm to software, loss of data, or an interruption in service.

**WARNING:**

Warning statements call attention to situations that can result in harm to hardware or equipment.

**DANGER:**

Danger statements call attention to situations that can result in harm to personnel.

**SECURITY ALERT:**

Security alert statements call attention to situations that can increase the potential for unauthorized use of a telecommunications system.

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## Reasons for reissue

The May 2006 version of this document was changed for the following reasons:

- To make general wording and format corrections.

Issue 3.0 of this document was changed for the following reasons:

- To add information about the new V890 model of the Sun Fire computer. The V890 is replacing the V880 model beginning with CMS R13. The V890 includes information about the following new hardware:
  - Quad GigaSwift Ethernet card, single Gigabit Ethernet card, and Dual Ultra320 SCSI card
  - IDE model DVD-ROM
  - 146-GB disk drives
- To add information about CMS R13.
- To note that the Sun Fire V880 is going from 256-MB DIMMs to 512-MB DIMMs.
- To update the recommended card layout on the V880 (see [Computer layout](#) on page 28 and [Maintaining PCI cards](#) on page 60).
- To make general wording and format corrections.

Issue 2.0 of this document was changed for the following reasons:

- To add information about the new DAT 72 tape drive.
- To note that X.25 switch links are not supported for CMS R12 and later (see [Connecting the switch link](#) on page 40).
- To update information that the newer Dual FastEthernet and Dual SCSI card supports hot plug operation (see [Maintaining hot-plug PCI cards](#) on page 65).
- To update the tape ordering procedures (see [Ordering tapes](#) on page 124).
- To make general wording and format corrections.

Issue 1.1 of this document was changed for the following reasons:

- To add information about the new Dual FastEthernet and Dual SCSI card. This card is replacing the SunSwift card. See the following sections for more information:
  - [Computer layout](#) on page 28
  - [Peripheral connectivity](#) on page 36
  - [Parts list](#) on page 37
  - [Computer layout](#) on page 51
  - [PCI card configuration](#) on page 61
- To update the remote console setup procedure (see [Setting the remote console modem options](#) on page 46).
- To add a procedure for installing software for the XVR-100 graphic accelerator card (see [Installing the XVR-100 software packages \(V880 and R3V11 only\)](#) on page 78).
- To update the tape ordering procedures (see [Ordering tapes](#) on page 124).
- To make general wording and format corrections.

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## Related documentation

You might find the following Avaya CMS documentation useful. This section includes the following topics:

- [Change descriptions](#) on page 14
- [Administration documents](#) on page 14
- [Software documents](#) on page 15
- [Hardware documents](#) on page 15
- [Call Center documents](#) on page 16
- [Avaya CMS upgrade documents](#) on page 16
- [Documentation Web sites](#) on page 18

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## Change descriptions

For information about recent changes made in Avaya CMS and Avaya Call Center, see:

- *Avaya Call Management System (CMS) Release 13.1 Change Description*, 07-600955
- *Avaya Call Center Release 3.1 Change Description*, 07-300560
- *Avaya Call Center 3.0 and Call Management System Release 13 Change Description*, 07-300304

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## Administration documents

For more information about Avaya CMS administration, see:

- *Avaya Call Management System Release 13 Administration*, 07-600956
- *Avaya Call Management System (CMS) Release 13 Database Items and Calculations*, 07-300330
- *Avaya Call Management System Supervisor Release 13 Reports*, 07-300334
- *Avaya Call Management System (CMS) Supervisor Release 13 Installation and Getting Started*, 07-300333
- *Avaya Call Management System High Availability User Guide*, 07-300066
- *Avaya Call Management System High Availability Connectivity, Upgrade and Administration*, 07-600957

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## Software documents

For more information about Avaya CMS software, see:

- *Avaya Call Management System Release 13 Software Installation, Maintenance, and Troubleshooting Guide*, 07-600954
- *Avaya CMS Open Database Connectivity Version 4.2*, 585-780-701
- *Avaya Call Management System Release 13 LAN Backup User Guide*, 07-600953
- *Avaya Call Management System Release 13 External Call History Interface*, 07-300737
- *Avaya CMS Custom Reports*, 585-215-822
- *Avaya CMS Forecast User Guide*, 585-215-825
- *Avaya Visual Vectors Release 13 Installation and Getting Started*, 07-300353
- *Avaya Visual Vectors Release 13 User Guide*, 07-300354
- *Avaya Call Management System (CMS) Supervisor Release 13 Report Designer*, 07-300743

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## Hardware documents

For more information about Avaya CMS hardware, see:

- *Avaya Call Management System Sun Netra 210 Computer Hardware Installation, Maintenance, and Troubleshooting*, 07-600963
- *Avaya Call Management System Sun Fire V880/V890 Computer Hardware Installation, Maintenance, and Troubleshooting*, 07-600965
- *Avaya Call Management System Sun Blade 100/150 Workstation Hardware Installation, Maintenance, and Troubleshooting*, 07-600964
- *Avaya Call Management System Terminals, Printers, and Modems*, 585-215-874

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## Call Center documents

For more information about Avaya Call Center documents, see:

- *Avaya Communication Manager Call Center Software Basic Call Management System (BCMS) Operations*, 07-300061
- *Avaya Call Center Call Vectoring and Expert Agent Selection (EAS) Guide*, 07-300477
- *Avaya Call Center Automatic Call Distribution (ACD) Guide*, 07-300478
- *Avaya Business Advocate User Guide*, 07-300653
- *Avaya Call Management System Switch Connections, Administration, and Troubleshooting*, 07-300739

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## Avaya CMS upgrade documents

There are several upgrade paths supported with Avaya CMS. There is a document designed to support each upgrade.

This section includes the following topics:

- [Base load upgrades](#) on page 16
- [Platform upgrades and data migration](#) on page 17
- [Avaya Call Management System Upgrade Express \(CUE\)](#) on page 17

### Base load upgrades

Use a base load upgrade when upgrading CMS to the latest load of the same version (for example, r13ak.g to r13al.k). A specific set of instructions is written for the upgrade. The instructions are shipped to the customer site with the CMS software CD-ROM as part of a Product Correction Notice (PCN).

For more information about base load upgrades, see:

- *Avaya Call Management System Release 13 Base Load Upgrade*



## Platform upgrades and data migration

Use a platform upgrade when upgrading to a new hardware platform (for example, upgrading from a SPARCserver 5 to a Sun Netra 210). The new hardware platform is shipped from the Avaya factory with the latest CMS load. Therefore, as part of the upgrade you will have the latest CMS load (for example, R3V9 to R13).

For more information about platform upgrades and data migration, see:

- *Avaya Call Management System Release 13 Platform Upgrade and Data Migration*, 07-600968

## Avaya Call Management System Upgrade Express (CUE)

Use CUE when CMS is being upgraded from an earlier version (for example, R3V9) to the latest version (for example, R13).

A specific set of upgrade instructions is written for the upgrade. These instructions are included on the CUE software CD-ROM that is shipped to the customer site with the CUE kit.

For information about customer requirements for CUE upgrades, see:

- *Avaya Call Management System Release 13 CMS Upgrade Express (CUE) Customer Requirements*, 700356744

For information about CUE upgrade procedures, see:

- *Avaya Call Management System Release 13.1 Sun Blade 100/150 Workstation Mirrored and Nonmirrored Systems CMS Upgrade Express (CUE)*, 07-600763
- *Avaya Call Management System Release 13.1 Sun Fire V880/V890 Computer CMS Upgrade Express (CUE)*, 07-600764

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## Documentation Web sites

For Avaya product documentation, go to <http://www.avayadocs.com>. Additional information about new software or hardware updates will be contained in future issues of this book. New issues of this book will be placed on the Web site when available.

Use the following Web sites to view related support documentation:

- Information about Avaya products and service  
<http://www.avaya.com>
- Sun hardware documentation  
<http://docs.sun.com>
- Informix documentation  
<http://www.informix.com>
- Tivoli Storage Manager documentation  
<http://www.tivoli.com>

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## Support

### Contacting Avaya technical support

Avaya provides support telephone numbers for you to report problems or ask questions about your product.

For United States support:

1- 800- 242-2121

For international support:

See the [1-800 Support Directory](#) listings on the Avaya Web site.

### Escalating a technical support issue

Avaya Global Services Escalation Management provides the means to escalate urgent service issues. For more information, see the [Escalation Management](#) listings on the Avaya Web site.

# Installation

This section describes how to install the computer and related peripheral equipment. Use the following table to check off each required procedure after completion.

Procedure	Completed
<a href="#">Preparing for installation</a> on page 20	
<a href="#">Unpacking and inventorying the equipment</a> on page 25	
<a href="#">Setting up power</a> on page 35	
<a href="#">Peripheral connectivity</a> on page 36	
<a href="#">Connecting the monitor, keyboard, and mouse</a> on page 38	
<a href="#">Connecting the remote console modem</a> on page 39	
<a href="#">Connecting to external interfaces:</a>	
• <a href="#">Connecting the switch link</a> on page 40	
• <a href="#">Connecting to the customer network</a> on page 40	
<a href="#">Turning on the system and verifying POST</a> on page 41	
<a href="#">Identifying installed PCI cards</a> on page 44	
<a href="#">Setting the remote console modem options</a> on page 46	
<a href="#">Turning the system over for provisioning</a> on page 48	

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## Preparing for installation

This section contains the following information that will help you prepare for the computer installation:

- [Safety precautions](#) on page 20
- [System precautions](#) on page 21
- [Required tools](#) on page 22
- [Electrical specifications](#) on page 22
- [Physical specifications](#) on page 23
- [Service access specifications](#) on page 23
- [Environmental specifications](#) on page 24

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## Safety precautions

For your protection, observe the following safety precautions when setting up your equipment:

- Follow all cautions, warnings, and instructions that are marked on the equipment.
- Never push objects of any type through openings in the equipment. Objects might touch dangerous voltage points or short out components, resulting in fire or an electric shock.
- When moving the computer, be careful not to unplug any power or data cables.
- Refer servicing of equipment to qualified personnel.
- To protect both yourself and the equipment, observe the following precautions.

Item	Problem	Precaution
Wrist or foot strap	ESD	Wear a conductive wrist strap or foot strap when handling printed circuit boards.
Cover panels	System damage and overheating	Reinstall all cabinet cover panels after you perform any service work on the system.
Card slot filler panels	System damage and overheating	Ensure that a filler panel is installed on all empty card slots.

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## System precautions

Ensure that the voltage and frequency of the power outlet that is used matches the electrical rating labels on the equipment.

Wear antistatic wrist straps when handling any magnetic storage devices, CPU/Memory boards, or other printed circuit boards.

The V880 computer has three autoranging power supplies that use nominal input voltages of 100 to 240 V AC at 47 to 63 Hz. The V890 computer has three autoranging power supplies that use nominal input voltages of 200 to 240 V AC at 47 to 63 Hz.

**WARNING:**

You cannot interchange power supplies between a V880 and V890 computer.

Sun products are designed to work with single-phase power systems that have a grounded neutral conductor. To reduce the risk of electrical shock, do not plug Sun products into another type of power source. Contact your facilities manager or qualified electrician if you are unsure of what type of power is supplied to your building.

Avaya recommends that you use one of the following power schemes:

- For a V880, use two (2) 2KVA Uninterruptible Power Supplies (UPS) (or equivalent), each powered by a nonswitched, dedicated, 15-amp circuit. Connect two of the power supplies to one UPS, and the third power supply to the second UPS. The monitor and external peripherals can also be connected to the second UPS.
- For a V890, use one 6KVA UPS (or equivalent), powered by a nonswitched, dedicated, 15-amp circuit. Connect all of the power supplies to the UPS. The monitor and external peripherals can also be connected to the UPS.

**Note:**

If not using a UPS, connect each power supply to a nonswitched, dedicated, 15-amp circuit. Connect the monitor and external peripherals to a separate circuit.

Each of the following items require a separate power cord:

- Power supplies in the computer (3 power cords)
- External peripherals
- Monitor

**WARNING:**

*Do not* make mechanical or electrical modifications to the cabinet. Sun Microsystems is not responsible for regulatory compliance of modified cabinets.

## Required tools

You need the following tools to do the installation:

- Phillips #2 screwdriver
- ESD grounding wrist strap
- Antistatic mat

## Electrical specifications

Parameter	Value	
	V880	V890
Input <ul style="list-style-type: none"> <li>• Nominal voltage range</li> <li>• Maximum current AC RMS</li> <li>• AC operating range</li> <li>• Nominal frequencies</li> </ul>	<ul style="list-style-type: none"> <li>• 100-240 V AC, autoranging</li> <li>• 15.0 A @100 VAC</li> <li>• 90-264 V rms, 47-63Hz</li> <li>• 50 Hz or 60 Hz</li> </ul>	<ul style="list-style-type: none"> <li>• 200-240 V AC, autoranging</li> <li>• 8.0 A @200 VAC</li> <li>• 180-264 V rms, 47-63Hz</li> <li>• 50 Hz or 60 Hz</li> </ul>
Maximum DC power output	2240 W	2509 W
Maximum system AC power consumption	3000 W	3200 W
Maximum system heat dissipation	10308 BTU/hr	10912 BTU/hr
Volt-ampere rating	1515 VA with 1120 Watt load (PF=0.99)	2078 VA with 1629 Watt load (PF=0.98)
Wall plug type <ul style="list-style-type: none"> <li>• United States</li> <li>• Non-United States</li> </ul>	<ul style="list-style-type: none"> <li>• NEMA 5-15P</li> <li>• Power cords must be obtained locally</li> </ul>	<ul style="list-style-type: none"> <li>• NEMA 6-15P</li> <li>• Power cords must be obtained locally</li> </ul>
CPU plug type	IEC 320	IEC 320

---

## Physical specifications

Parameter	English value	Metric value
Height (with casters)	28.1 inches	71.4 centimeters
Width	18.9 inches	48.0 centimeters
Depth	32.9 inches	83.6 centimeters
Weight (min-max) <sup>1</sup>	194-288 pounds	88-130.6 kilograms
Power cords	8.2 feet	2.5 meters

1. The actual weight depends on the installed options.

---

## Service access specifications

Parameter	English value	Metric value
Front <sup>1</sup>	36 inches	91 centimeters
Rear	36 inches	91 centimeters
Left	36 inches	91 centimeters
Right	36 inches	91 centimeters

1. 48 inches (122 centimeters) for rack mounted systems.

---

## Environmental specifications

For the most reliable system operation:

- The room must have sufficient air conditioning capacity to support the cooling needs of the entire system.
- The air conditioning system must have controls that prevent excessive temperature changes.
- Do not turn on the computer until it has acclimated to the room temperature for at least 24 hours.

Use the guidelines in the following table for temperature, humidity, and altitude limits for units in operation and for units that are not in operation (that is, units that are in transit or in storage).

Parameter	Operating (in service)	Nonoperating (not in service)
Temperature	41°F to 95°F (5°C to 35°C) IEC 68-2-2, 68-2-3	-4°F to 140°F (-20°C to 60°C) IEC 68-2-2, 68-2-3
Humidity (max)	20% to 80% RH noncondensing at 27°C max wet bulb IEC 68-2-2, 68-2-3	95% RH noncondensing at 40°C IEC 68-2-2, 68-2-3
Altitude (max)	10,000 feet (3 kilometers) IEC 68-2-40, 68-2-41	40,000 feet (12 kilometers) IEC 68-2-40, 68-2-41



---

## Unpacking and inventorying the equipment

**WARNING:**

Never move the system when the power is on. Excessive movement can cause catastrophic disk drive failure. Always turn off the power before moving cabinets.

**WARNING:**

Always wear an electrostatic discharge (ESD) wrist strap when handling internal components.

**CAUTION:**

Always have up-to-date system backups before turning the computer off and moving the computer.

Inspect all shipping cartons for evidence of physical damage. If a shipping carton is damaged, request that the carrier representative be present before the carton is opened.

Unpack the computer and the associated peripheral equipment. Compare the contents of the carton to the shipping inventory list to verify that all equipment was delivered.

In the United States, contact Avaya technical support if any parts are defective on arrival. Contact Avaya customer service if any parts are missing.

Outside the United States, contact your Avaya representative or distributor if any parts are missing or defective.

This section includes the following topics:

- [Parts list](#) on page 26
- [Determining the computer model](#) on page 27
- [Computer layout](#) on page 28
- [Hardware options](#) on page 33
- [Rack mounting](#) on page 34

## Parts list

Verify that you have the following components before you start the installation:



**Important:**

DO NOT install internal hardware shipped loose with the Sun computer at this time. This is done under the direction of a CMS Provisioning engineer at a scheduled appointment time.

- Sun Fire cabinet, including installed cards and disk drives
- Computer power cords (3)
- Monitor, cable, and monitor AC power cord
- USB keyboard and cable
- USB mouse and cable
- A package of blank tapes for backups
- One tape that contains the Avaya factory configuration CMSADM filesystem backup
- Category 5 LAN cable
- Modem and cables
- Keys
- Sun and CMS software

**Note:**

CMS computers do not ship with tape drive cleaning tapes. Avaya recommends that customers purchase at least one cleaning tape as soon as the computer is installed and in service.

---

## Determining the computer model

This book is written for use with several different models of the Sun Fire computer. The differences between the models are few. This section shows how to identify the different models.

### Features

Each of the different models have distinctive features that will also assist you in determining what model you have.

**V880 Model 1:** 900 MHz UltraSparc III CPUs, 256-MB DIMMs, 73-GB 10K rpm disks, SCSI DVD-ROM drive, DDS-4 SCSI tape drive, 120 or 220 volt AC

**V880 Model 2:** 1.2 GHz UltraSparc III CPUs, 256-MB DIMMs, 73-GB 10K rpm disks, SCSI DVD-ROM drive, DAT 72 SCSI tape drive, 120 or 220 volt AC

**V880 Model 3:** 1.2 GHz UltraSparc III CPUs, 512-MB DIMMs, 73-GB 10K rpm disks, SCSI DVD-ROM drive, DAT 72 SCSI tape drive, 120 or 220 volt AC

**V890 Model 1:** 1.35 GHz UltraSparc IV CPUs, 146-GB 10K rpm disks, IDE DVD-ROM drive, DAT 72 SCSI tape drive, 220 volt AC only

### Physical labeling

All models are labeled on the front as Sun Fire 880, Sun Fire V880, or Sun Fire V890.

### Software check

To determine the model of the computer once the computer is operational:

1. Log in as root.
2. Enter:

```
prtconf -vp | grep banner-name
```

**V880 Models 1, 2, and 3:** The following message is displayed:

```
banner-name: 'Sun Fire 880'
```

**V890 Model 1:** The following message is displayed:

```
banner-name: 'Sun Fire V890'
```

---

## Computer layout

Familiarize yourself with the layout of the computer. The minimum configuration for the computer depends on the model.

### The layout of the V880 is as follows:

- One CPU/Memory board with two UltraSPARC III processors and 4-GB total memory
- Four 73-GB disk drives, mirrored two plus two (optionally, a third pair of disks can be added to support the AUX 100 software load)
- One built-in ethernet port
- One of the following SCSI/ethernet cards:
  - SunSwift card installed in slot 2, or
  - Dual FastEthernet and Dual SCSI card installed in slot 2



#### **Important:**

On earlier versions of the V880, the ethernet cards were installed in the following order:

Slots 0, 1, 2, and 5

Avaya now recommends that ethernet cards be installed in the following order:

Slots 2, 1, 6, and 5

See [V880 PCI card configuration](#) on page 62 for more information.

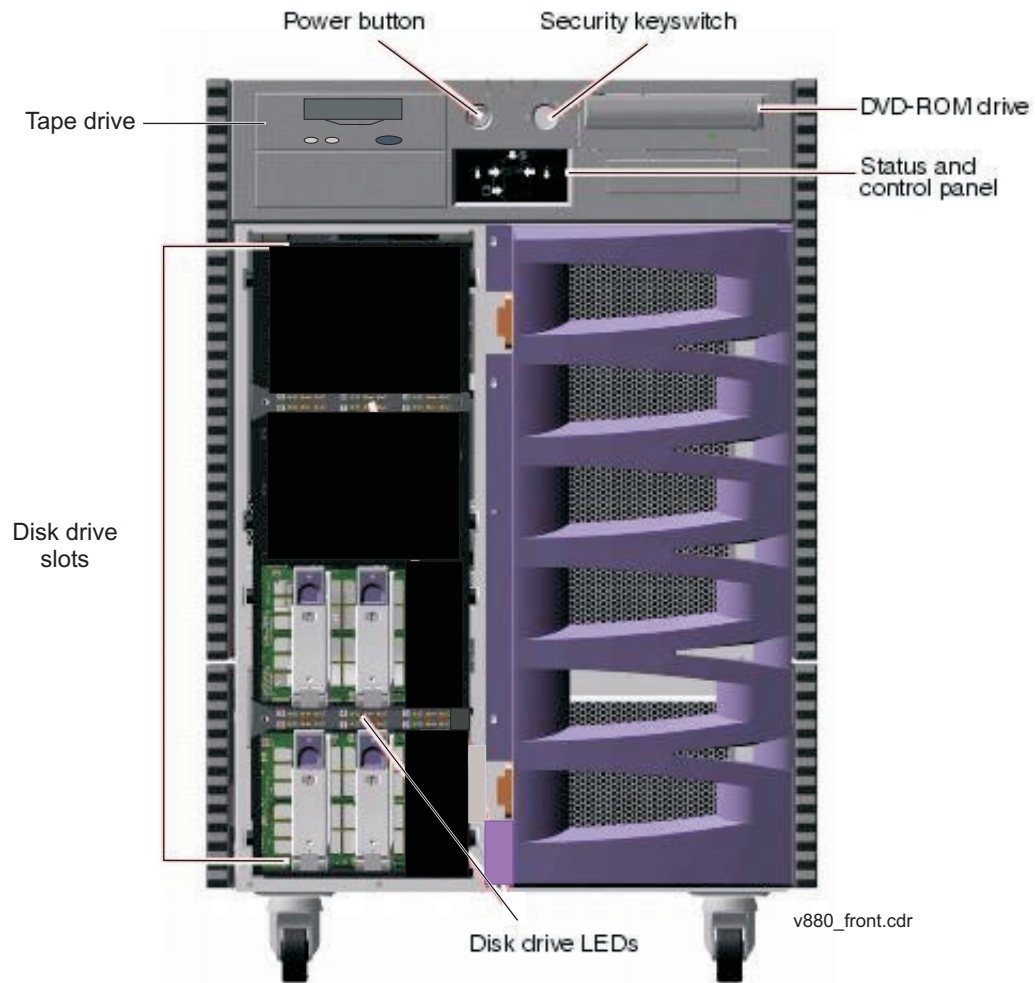
- One graphics PCI card installed in slot 7
- Three power supplies and power cords
- One DVD-ROM drive
- One tape drive
- Two USB ports
- One serial port

**The layout of the V890 is as follows:**

- One CPU/Memory board with two UltraSPARC IV processors and 8-GB total memory
- Four 146-GB disk drives, mirrored two plus two
- One built-in ethernet port
- One Dual Ultra320 SCSI card installed in slot 0
- One graphics card installed in slot 1
- One Quad GigaSwift ethernet card installed in slot 6
- Three power supplies and power cords
- One DVD-ROM drive
- One tape drive
- Two USB ports
- One serial port

## Front panel

The following figure shows the front of the computer with the disk drive door open.



## Back panel - V880

The following figure shows the back panel of the V880 computer. The slots designated for optional ethernet cards can house the FastEthernet, Quad GigaSwift, or single Gigabit ethernet cards.



### Important:

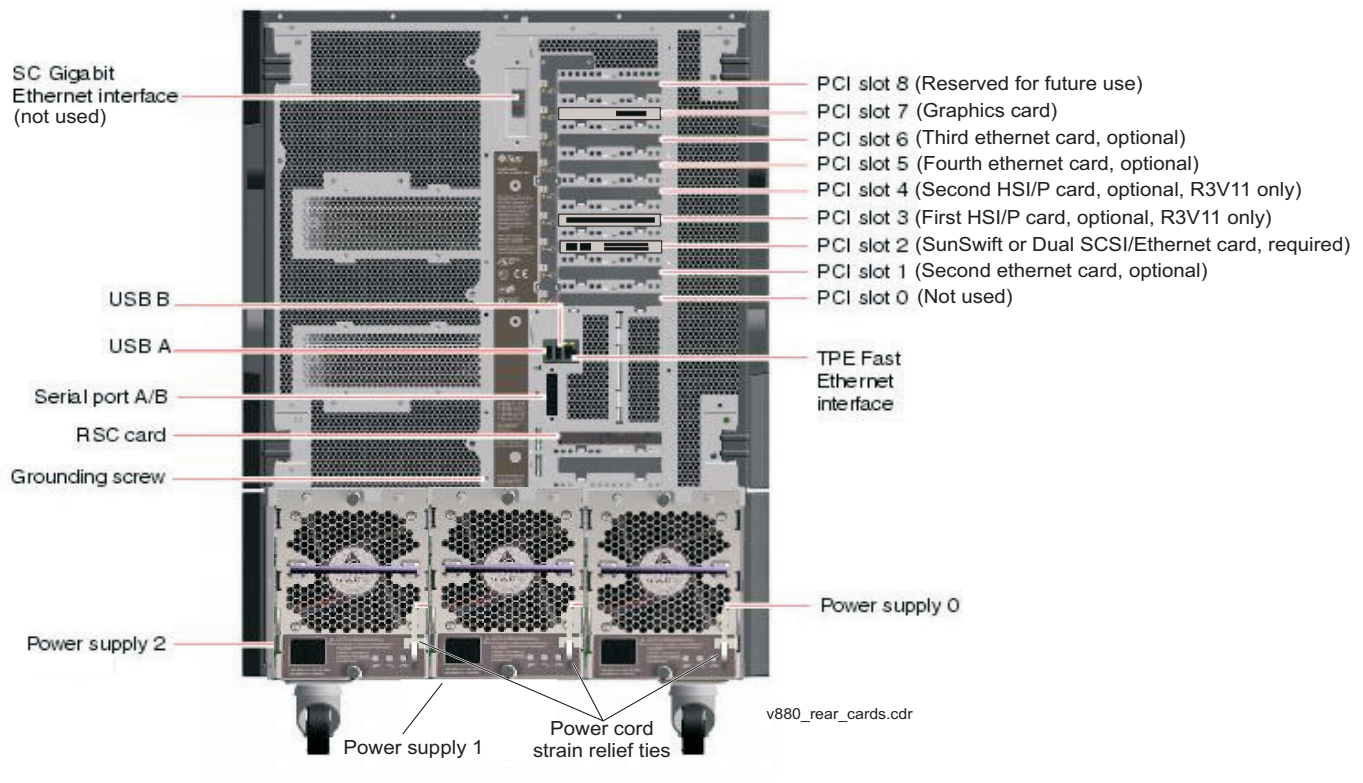
On earlier versions of the V880, the ethernet cards were installed in the following order:

Slots 0, 1, 2, and 5

Avaya now recommends that ethernet cards be installed in the following order:

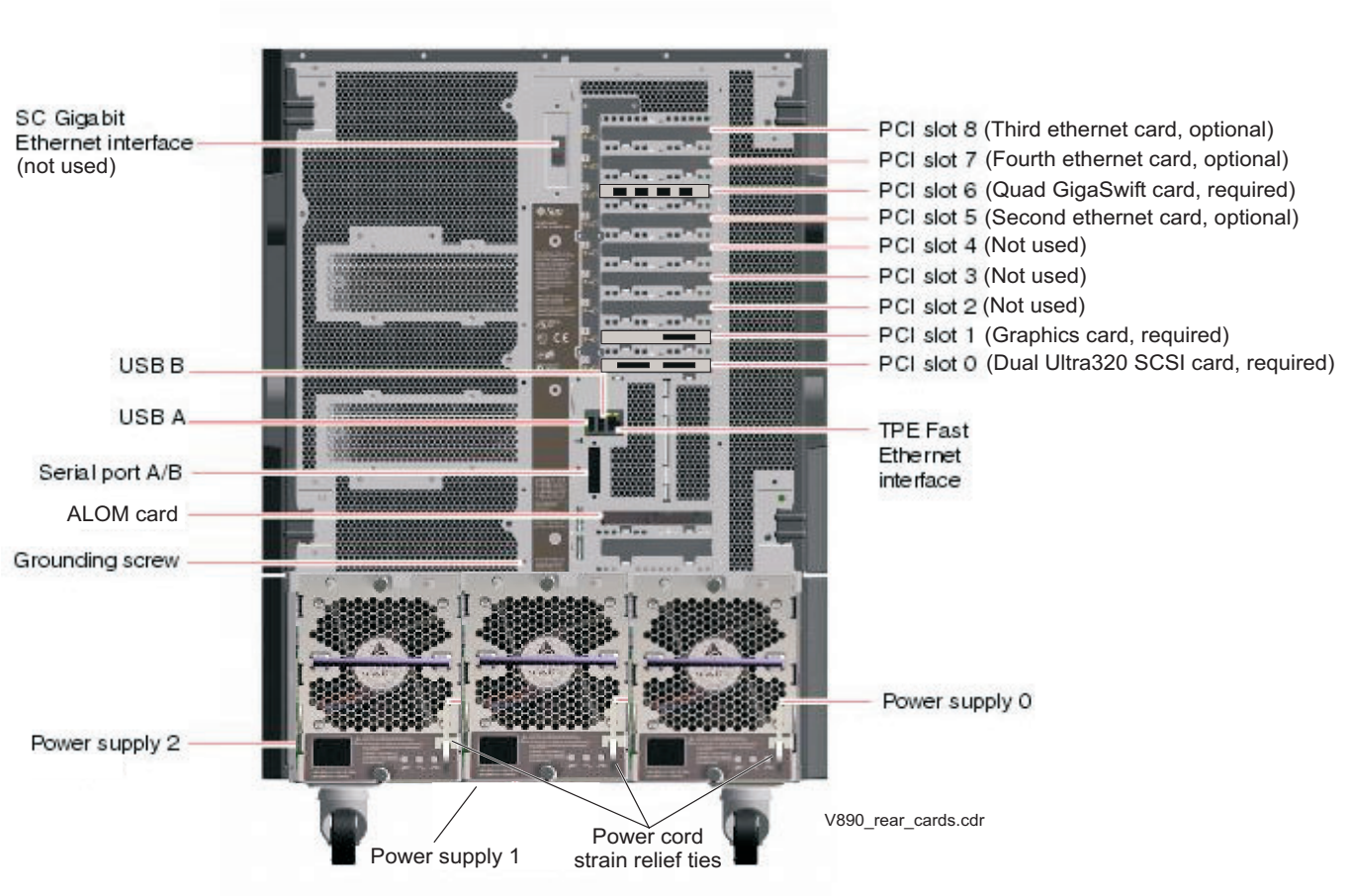
Slots 2, 1, 6, and 5

See [V880 PCI card configuration](#) on page 62 for more information.



## Back panel - V890

The following figure shows the back panel of the V890 computer. The slots designated for optional ethernet cards can house the Quad GigaSwift or single Gigabit ethernet cards. See [V890 PCI card configuration](#) on page 63 for more information.





## Hardware options

This section includes the following topics:

- [V880 hardware options](#) on page 33
- [V890 hardware options](#) on page 33

### V880 hardware options

Option	Quantity		Comments
	Minimum	Maximum	
CPU/Memory boards	1	4	Each board has two CPU modules and 4-GB memory.
PCI I/O cards	2	7	There are nine slots, but only seven slots can be used. For a listing of where the PCI cards can be installed, see <a href="#">V880 PCI card configuration</a> on page 62.
Disk drives (73-GB)	4	6	A pair of data disks can be added to the system when using the AUX 100 load.

### V890 hardware options

Option	Quantity		Comments
	Minimum	Maximum	
CPU/Memory boards	1	2	Each board has two CPU modules and 8-GB memory.
PCI I/O cards	2	6	There are nine slots, but only six slots can be used. For a listing of where the PCI cards can be installed, see <a href="#">V890 PCI card configuration</a> on page 63.
Disk drives (146-GB)	4	4	

## Rack mounting

The computer can be rack mounted. For information about rack mounting, see *Sun Fire 880 Server Rackmounting Guide* or *Sun Fire V890 Server Rackmounting Guide* at the Sun documentation Web site:

<http://docs.sun.com>

When rack mounting the computer, the technician must remove the following components as described in the rack mounting guide:

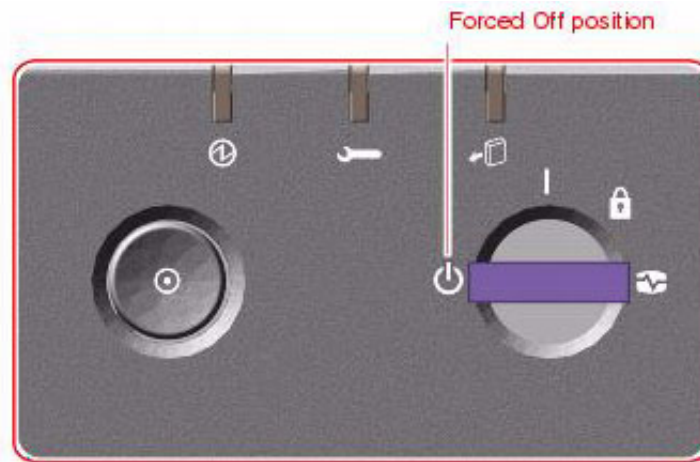
- all CPU/Memory boards
- all power supplies
- all CPU fan trays
- all I/O fan trays

---

## Setting up power

To set up the AC power:

1. Locate the key switch, insert the key, and turn the key switch to the Forced Off position. See the following figure.



2. Connect the IEC 320 end of each power cord to the AC connector of each power supply.  
For installations outside the United States and Canada, obtain three power cords for your local configuration.
3. Route the power cord through the strain-relief tie-wrap loop located to the right of the supply. Tighten the tie-wrap to secure the connection.
4. Connect the power using one of the following schemes:
  - For a V880, use two (2) 2KVA Uninterruptible Power Supplies (UPS) (or equivalent), each powered by a nonswitched, dedicated, 15-amp circuit. Connect two of the power supplies to one UPS, and the third power supply to the second UPS. The monitor and external peripherals can also be connected to the second UPS.
  - For a V890, use one 6KVA UPS (or equivalent), powered by a nonswitched, dedicated, 15-amp circuit. Connect all of the power supplies to the UPS. The monitor and external peripherals can also be connected to the UPS.

**Note:**

If not using a UPS, connect each power supply to a nonswitched, dedicated, 15-amp circuit. Connect the monitor and external peripherals to a separate circuit.

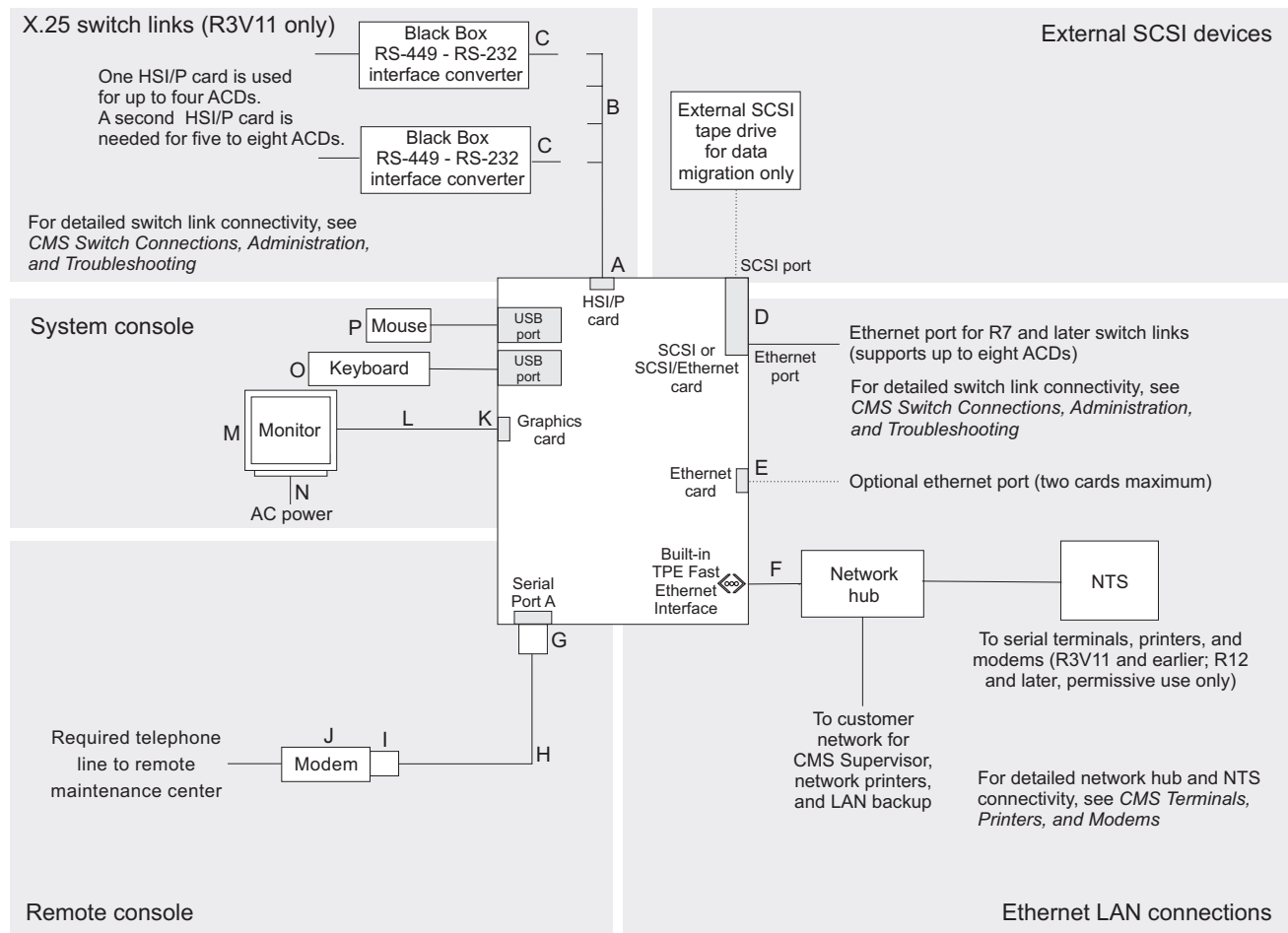


**Important:**

Do not turn on power at this time.

## Peripheral connectivity

The following figure shows in general how equipment is connected to the computer. The callouts are described in [Parts list](#) on page 37.



sunfire880conn.cdr

## Parts list

The following table lists the parts that are required to connect most external devices to the computer. For information about switch connections for CMS, see *Avaya Call Management System Switch Connections, Administration, and Troubleshooting*.

Connectivity diagram call out	Material ID or part of Material ID	Description
A <sup>1</sup>	408128288	HSI/P card (V880 only; up to two may be installed)
B <sup>1</sup>		HSI/P quad cable (V880 only; 1 per HSI/P card)
C	407086818	RS-449 cable (V880 only; 10 feet, 3 meters)
D	N/A <sup>2</sup>	SunSwift card (V880 only), or Dual FastEthernet and Dual SCSI card (V880 only), or Dual Ultra320 SCSI card (V890 only)
E <sup>1</sup>	700230105 700397599 700362403	FastEthernet 10/100 Mbps card (V880 only), or Quad GigaSwift Ethernet card, or Single Gigabit Ethernet card
F	407086826	Category 5 UTP cable (10 feet, 3 meters)
G	846362754	DB25-to-RJ45 ACU modem adapter
H	846983039	10-wire modular cord (10 feet, 3 meters)
I	846362770	RJ45-to-DB25 remote console adapter
J	407633999 Varies	Sportster Model 839 33.6 remote console modem Comsphere 3910 remote console modem
K <sup>1</sup>	N/A <sup>2</sup>	Graphics card
L <sup>1</sup>	N/A <sup>2</sup>	Monitor cable
M <sup>1</sup>	N/A <sup>2</sup>	Monitor
N <sup>1</sup>	N/A <sup>2</sup>	Monitor AC power cord
O <sup>1</sup>	N/A <sup>2</sup>	USB keyboard with cable
P <sup>1</sup>		USB mouse with cable

1. Sun Microsystems provides maintenance sparing for these parts.

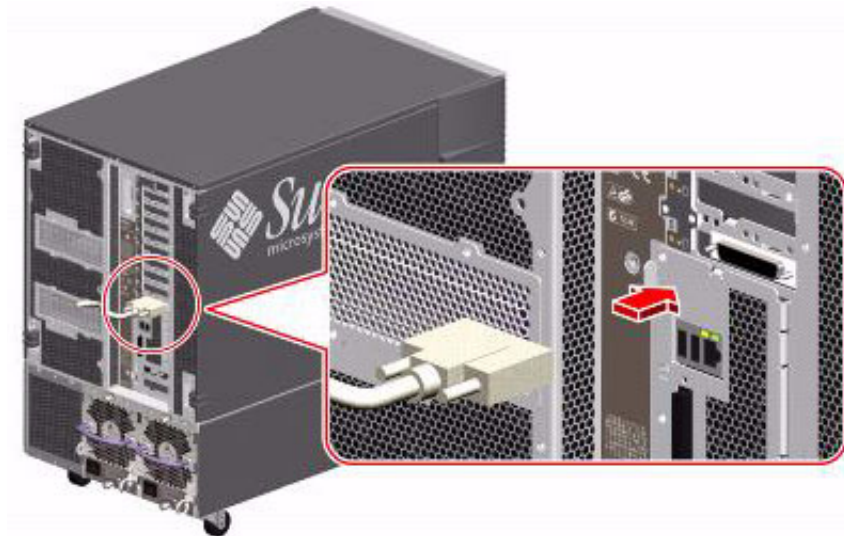
2. The comcode for this bundle changes regularly and may not be ordered for maintenance spares, so it is not listed in the table. This bundle includes the processor, peripherals, and other equipment.

---

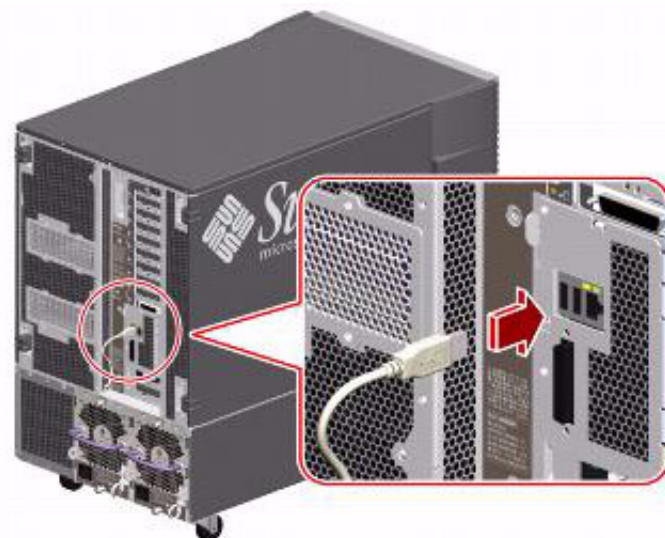
## Connecting the monitor, keyboard, and mouse

To connect the monitor, keyboard, and mouse to the computer:

1. Attach the monitor video cable to the graphics card. Tighten the thumbscrews to secure the connection. See the following figure.



2. Connect the monitor power cord to an approved AC power outlet.
3. Attach the USB keyboard cable to one of the USB ports.

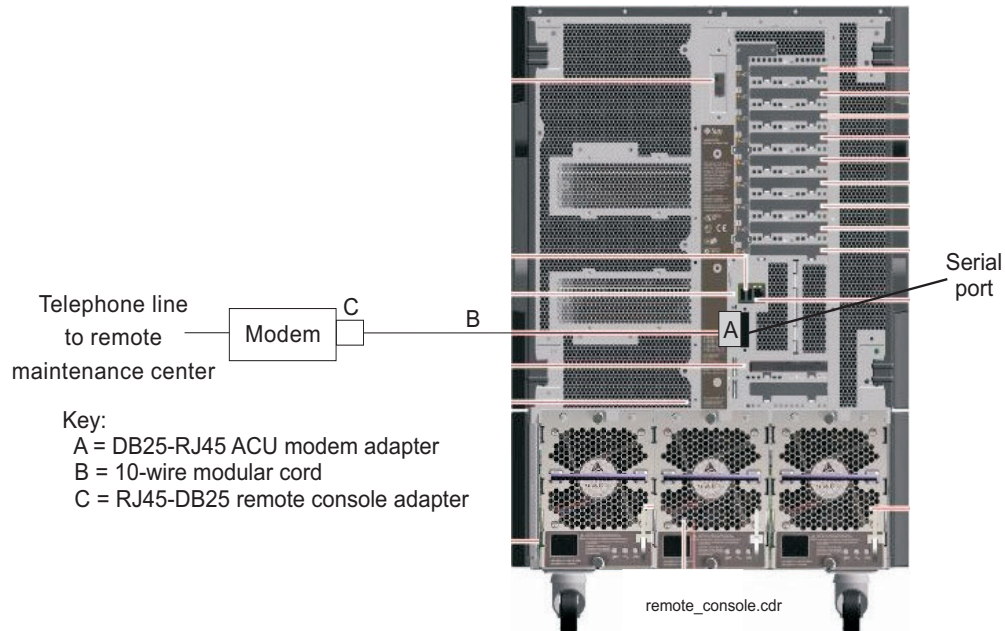


4. Attach the USB mouse cable to the other USB port.

## Connecting the remote console modem

This section describes how to connect the remote console modem to the computer. This modem allows personnel at a remote support center to dial in and do maintenance. The modem is a U.S. Robotics Sportster 33.6 Faxmodem in the U.S. and Canada or a modem provided locally for installations outside of the U.S. and Canada.

The following figure shows remote console modem connectivity.



To connect the remote console modem:

1. Connect the DB25-to-RJ45 ACU modem adapter (A) to the serial port on the back of the computer.
2. Connect the 10-wire modular cord (B) to the modular end of the ACU modem adapter (A).
3. Connect the other end of the 10-wire modular cord (B) to the modular end of the RJ45-to-DB25 remote console adapter (C).
4. Connect the remote console adapter (C) to the RS-232C port on the modem. The RS-232C port on the Comsphere 3910 is labeled "DTE1."
5. Connect the telephone line to the jack labeled "LINE" on the Sportster modem, or labeled "DIAL" on the Comsphere 3910 modem.
6. Connect the power cable to the modem and plug the cable into a socket.

Do not turn on the power yet. Instructions for turning on the modem are given in [Setting the remote console modem options](#) on page 46.

---

## Connecting to external interfaces

This section describes the external interfaces connected to the computer. This section includes the following topics:

- [Connecting the switch link](#) on page 40
- [Connecting to the customer network](#) on page 40

---

### Connecting the switch link

Use either of the following two ways to connect the CMS computer to a switch:

- TCP/IP over a dedicated local area network (LAN) segment. A LAN connection is supported for R7 and later switch releases, and is required for CMS R12 and later.
- X.25 protocol over a hard-wired or switched link. This is not supported for CMS R12 and later.

One CMS computer can collect data from several switches. To the CMS computer, each switch represents one ACD. You can have all switches connected using TCP/IP, all switches connected using X.25 protocol (not supported for CMS R12 and later), or some combination of the two protocols.

For detailed information about how to connect and administer the switch link, see *Avaya Call Management System Switch Connections, Administration, and Troubleshooting*.

---

### Connecting to the customer network

The computer supports built-in ethernet ports that support network speeds of 10/100 Mbps. This ethernet connection is used for CMS Supervisor, network printers, and LAN backup.



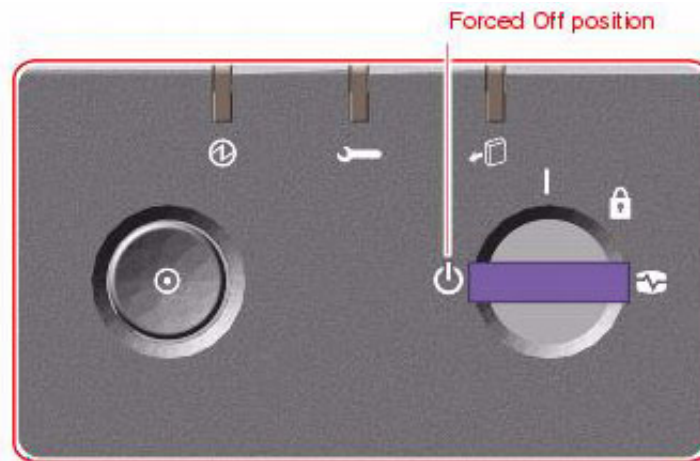
---

## Turning on the system and verifying POST

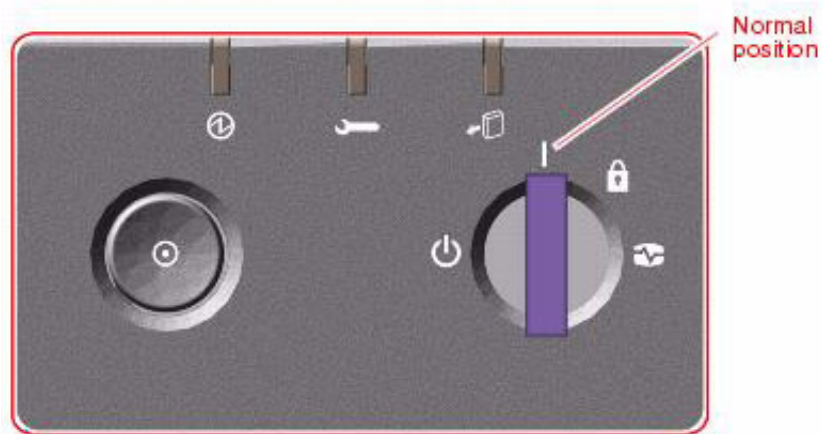
Once you assemble the system, including the loose hardware that is shipped with the system that you installed with help from CMS Provisioning, turn on the system and verify the results of the Power-On Self Test (POST).

To turn on the system and verify POST:

1. Verify that the key switch is in the Forced Off position. See the following figure.



2. If using one or more UPSs, plug the power cord of each UPS into a dedicated circuit. If not using a UPS, plug the power cords for each power supply into an outlet on a dedicated 15-amp circuit.
3. Turn on the power to the UPS units, if UPS units are installed.
4. Turn on the system monitor.
5. Turn the key switch to the normal On position. See the following figure.



6. Press and release the power button to the left of the key switch to turn on the system.

**Note:**

The POST diagnostics occur each time that you turn on the system. The POST diagnostics test the basic system components and can take several minutes.

While the system turns on, the power LED on the monitor flashes.

7. Press **Stop+A** simultaneously as soon as the monitor power LED lights steadily and the Sun logo is displayed on the monitor.

The **ok** prompt is displayed.

8. Enter the following commands:

```
setenv auto-boot? false
```

```
reset-all
```

The system resets to the **ok** prompt.

9. Enter:

```
probe-scsi-all
```

This command verifies that the system sees the disk drives and backplane, the tape drive, and the DVD drive (SCSI model in V880). A message that is similar to the following example is displayed:

```
/pci@8,600000/SUNW,qlc@2
LiD HA LUN --- Port WWN --- -----Disk description -----
0 0 0 21000004cf72f08f SEAGATE ST373405FSUN3660438
1 1 0 21000004cf721553 SEAGATE ST373405FSUN3660438
6 6 0 508002000016b5b1 SUNW SUNWGS INT FCBPL9224
3 3 0 21000004cf72114b SEAGATE ST373405FSUN3660438
4 4 0 21000004cf7211ae SEAGATE ST373405FSUN3660438

/pci@8,700000/scsi@1

Target 5
Unit 0 Removeable Tape HP C7438A V309
Target 6
Unit 0 Removeable Read Only device TOSHIBA DVD-ROM SD-M14011009
/pci@8,700000/pci@5/SUNW,lsptwo@4
```

10. Verify that all the devices are recognized. If the devices are not recognized, see [Troubleshooting disk drives and DVD drives](#) on page 186 for more information.

11. Enter:

**probe-ide**

This verifies that the system sees the DVD drive (IDE model in V890). A message that is similar to the following example is displayed:

```
Device 0 ( Primary Master )  
    Removeable ATAPI Model: TOSHIBA DVD-ROM SD-M1712  
  
Device 1 ( Primary Slave )  
    Not Present
```

12. Verify that the DVD is recognized. If it is not recognized, see [Troubleshooting disk drives and DVD drives](#) on page 186 for more information.
13. When you have verified that the system recognizes all its devices, enter the following commands:



**CAUTION:**

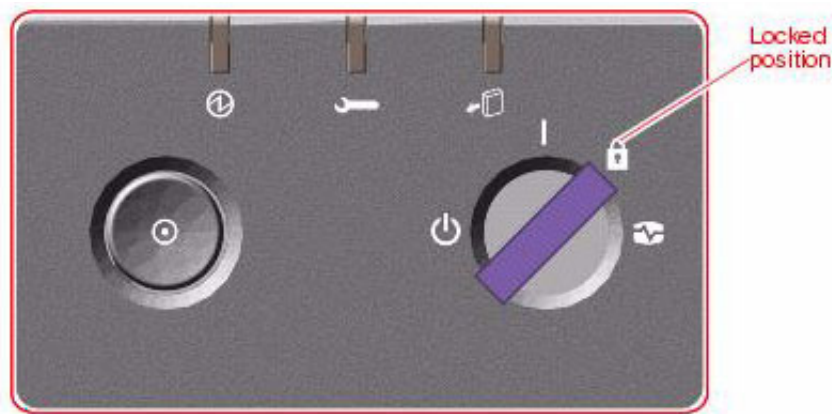
If you fail to reset the auto-boot option, any reboots that you do in the future will stop at the boot prompt instead of proceeding through the normal boot-up process.

**setenv auto-boot? true**

**boot**

The system reboots.

14. Turn the key switch to the Locked position. Keeping the switch in the Locked position prevents anyone from accidentally turning off the system. See the following figure.



## Identifying installed PCI cards

If there are problems with the PCI cards, do the following to troubleshoot the problem. If all PCI cards are operational, you can skip this procedure.

At the command prompt, enter:

```
/usr/platform/`uname -m`/sbin/prtdiag -v | pg
```

In the section **IO Cards**, there is a listing of the PCI cards. The following examples are some of the entries you might see. The display you see depends on your specific configuration.

```

.
.
===== IO Cards =====

```

Brd	IO Type	Port ID	Bus Side	Slot	Bus Freq MHz	Max Bus Freq MHz	Dev, Func	State	Name
I/O	PCI	8	B	1	33	33	4,0	ok	SUNW,XVR-100 SUNW,375-3181
I/O	PCI	8	B	0	33	33	5,0	ok	scsi-pci1000,30.1000.10c0.7/disk+LSI,1030
I/O	PCI	8	B	0	33	33	5,1	ok	scsi-pci1000,30.1000.10c0.7/disk+LSI,1030
I/O	PCI	9	B	6	33	33	2,0	ok	pci-pci8086,b154.0/pci (pci) PCI-BRIDGE
I/O	PCI	9	B	6	33	33	0,0	ok	pci-pci8086,b154.0/network (netw+ pci-bridge/pci-bridge
I/O	PCI	9	B	6	33	33	0,0	ok	network-pci100b,35.30 SUNW,pci-qge/pci-bridg+
I/O	PCI	9	B	6	33	33	1,0	ok	network-pci100b,35.30 SUNW,pci-qge/pci-bridg+
I/O	PCI	9	B	6	33	33	4,0	ok	pci-pci8086,b154.0/network (netw+ pci-bridge/pci-bridge
I/O	PCI	9	B	6	33	33	2,0	ok	network-pci100b,35.30 SUNW,pci-qge/pci-bridg+
I/O	PCI	9	B	6	33	33	3,0	ok	network-pci100b,35.30 SUNW,pci-qge/pci-bridg+

```

.
.

```

In this example:

- Slot 0 has a Dual Ultra320 SCSI card. There are two entries for a this card because the card has two SCSI ports.
- Slot 1 has a graphics card.
- Slot 6 has a Quad GigaSwift Ethernet card. There is more than one entry for this card because the card has four ethernet ports.

You can also use the `cfgadm` command to display the following information about the cards in the PCI slots:

Ap_Id	Type	Receptacle	Occupant	Condition
.				
.				
pcisch0:hpc1_slot0	mult/hp	connected	configured	ok
pcisch0:hpc1_slot1	vgs8514/hp	connected	configured	ok
pcisch0:hpc1_slot2	unknown	empty	unconfigured	unknown
pcisch0:hpc1_slot3	unknown	empty	unconfigured	unknown
pcisch2:hpc2_slot4	unknown	empty	unconfigured	unknown
pcisch2:hpc2_slot5	unknown	empty	unconfigured	unknown
pcisch2:hpc2_slot6	pci-pci/hp	connected	configured	ok
pcisch3:hpc0_slot7	unknown	empty	unconfigured	unknown
pcisch3:hpc0_slot8	unknown	empty	unconfigured	unknown
.				
.				

In this example:

- Slot 0 has a Dual Ultra320 SCSI card.
- Slot 1 has a graphics card.
- Slot 6 has a Quad GigaSwift Ethernet card.

---

## Setting the remote console modem options

The computer uses a modem for remote console access. The U.S. Robotics Sportster 33.6 Faxmodem is used in the U.S. and Canada. Outside of the U.S. and Canada, modems are purchased and set up according to local practices.

For instructions about connecting the modem, see [Connecting the remote console modem](#) on page 39.

New Sportster 33.6 faxmodems that come from the factory usually work with the CMS without any special option settings. All you have to do is set DIP switches 4 and 8 on the back panel of the modem to the down (ON) position and set all other DIP switches to the up (OFF) position. After doing this, test the modem for a connection. You may not have to do the procedure in this section.

To set the options on the Sportster 33.6 faxmodem:

1. Set DIP switches 1, 3, 7, and 8 on the back panel of the Sportster modem to the down (ON) position, and switches 2, 4, 5, and 6 to the up (OFF) position.
2. Turn on the remote console modem.
3. At the system console, log in as root.
4. Enter:

```
/cms/install/bin/abccadm -r ttya
```

The following message is displayed:

```
ttya is currently set to be incoming
Are you sure you want to change it? [y,n,?]
```

5. Enter: **y**

The following message is displayed:

```
ttya administration removed
```

6. Enter:

```
cu -s 9600 -b 8 -l cua/a
```

The following message is displayed:

```
Connected
```

7. Enter the following commands:

**AT**

**AT&F1** (loads the factory default configuration into active memory)

**AT&W0** (writes the current configuration to NVRAM template Y0)

**Note:**

Use numerical ones and zeros when entering the options.

8. After you enter the options, disconnect from the modem by entering a tilde and a period (~.).

The following message is displayed:

```
Disconnected
```

9. Set DIP switches 4 and 8 on the back panel of the Sportster modem to the down (ON) position. Set all other DIP switches to the up (OFF) position.
10. Reset the modem by turning the power off and back on.
11. Enter:

**/cms/install/bin/abcadm -i -b 9600 ttya**

The following message is displayed:

```
ttya set to incoming port 9600 baud
```

12. Verify that the AA (auto-answer), TR (terminal ready), and CS (clear-to-send) LEDs are lit on the modem.
13. Have the provisioning team dial in to the modem for testing.

**Additional references:** For additional information, see the *U.S. Robotics Sportster Modems Users Guide*.

---

## Turning the system over for provisioning

After completing the physical installation of the system, the installation continues with software provisioning. This is normally done with the support of the Avaya CMS Provisioning group.

Provisioning the system consists of the following procedures:

- Setting up CMS
- Authorizing features
- Adding logins and passwords
- Testing the software

To continue with provisioning, see the chapter "Turning the system over to the customer" in the CMS software installation, maintenance, and troubleshooting document for your CMS release.



# Maintenance

This section describes the following maintenance procedures:

- [Precautions](#) on page 50
- [Computer layout](#) on page 51
- [Turning the computer off and on](#) on page 54
- [Accessing components inside the computer](#) on page 56
- [Using an ESD wrist strap](#) on page 59
- [Maintaining PCI cards](#) on page 60
- [Maintaining disk drives](#) on page 96
- [Replacing the DVD drive](#) on page 119
- [Maintaining tape drives](#) on page 124
- [Maintaining CPU/Memory boards](#) on page 134
- [Replacing a power supply](#) on page 145

## Precautions



**DANGER:**

Hazardous energy levels are present inside the system when the system remains connected to a power source, regardless of the key switch position. Also, hazardous energy levels are present in the system's batteries even when all AC power cords are disconnected. Ensure that you follow the safety procedures in the owner's guide or service manual.



**WARNING:**

The graphics card, SCSI cards, and High-Speed Serial Interface/PCI (HSI/P) cards are not hot-pluggable cards. Before replacing these cards, you must turn off the computer.



**CAUTION:**

Printed circuit boards and hard disk drives contain electronic components that are extremely sensitive to static electricity. Ordinary amounts of static from your clothes or the work environment can destroy components. Do not touch the components or any metal parts without taking proper antistatic precautions. See [Using an ESD wrist strap](#) on page 59 for more information.



**CAUTION:**

Avoid keeping doors open for extended periods of time while the system is operating. All doors must be closed to prevent automatic thermal shutdown.

---

## Computer layout

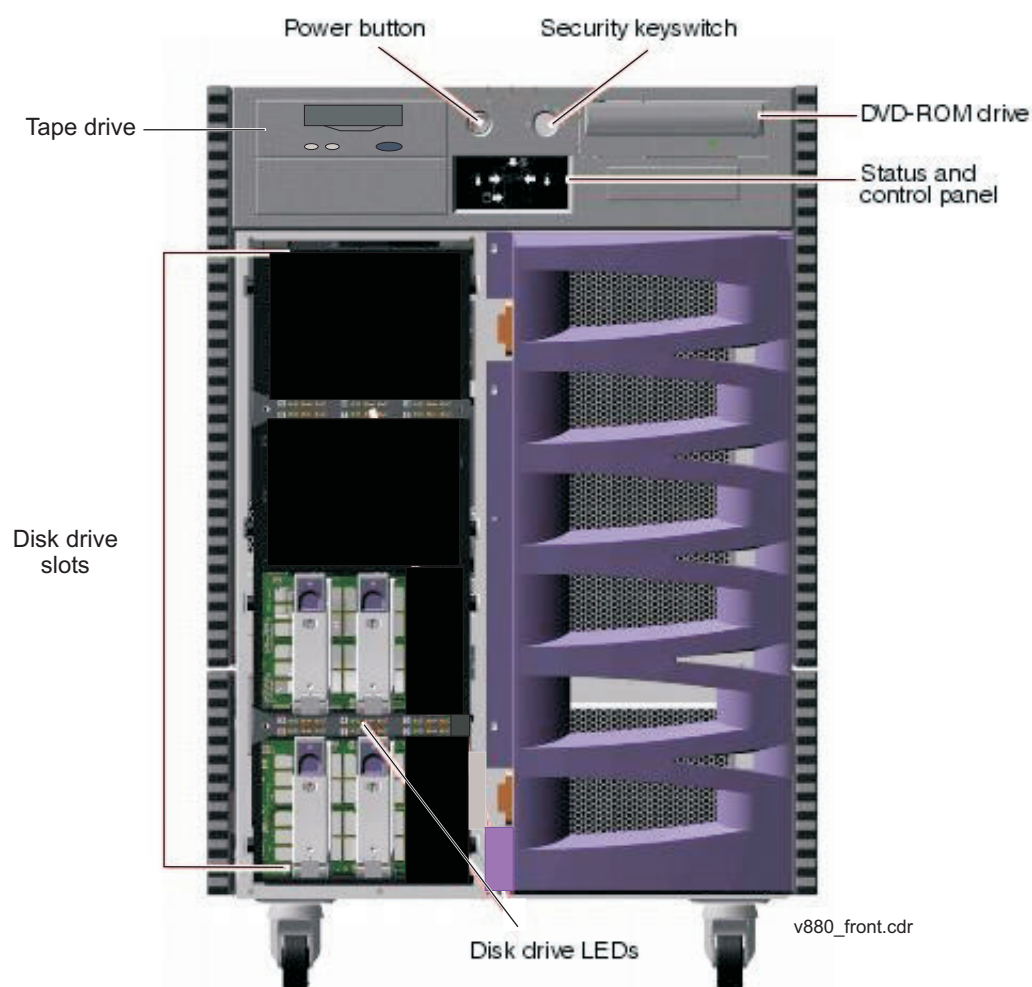
The following figures identify the basic hardware components of the computer:

- [Front panel](#) on page 51
- [Rear panel - V880](#) on page 52
- [Rear panel - V890](#) on page 53

---

### Front panel

The following figure shows the front of the computer with the disk drive door open.



## Rear panel - V880

The following figure shows the back panel of the V880 computer. The slots designated for optional ethernet cards can be either Quad GigaSwift ethernet cards or single Gigabit ethernet cards.



### Important:

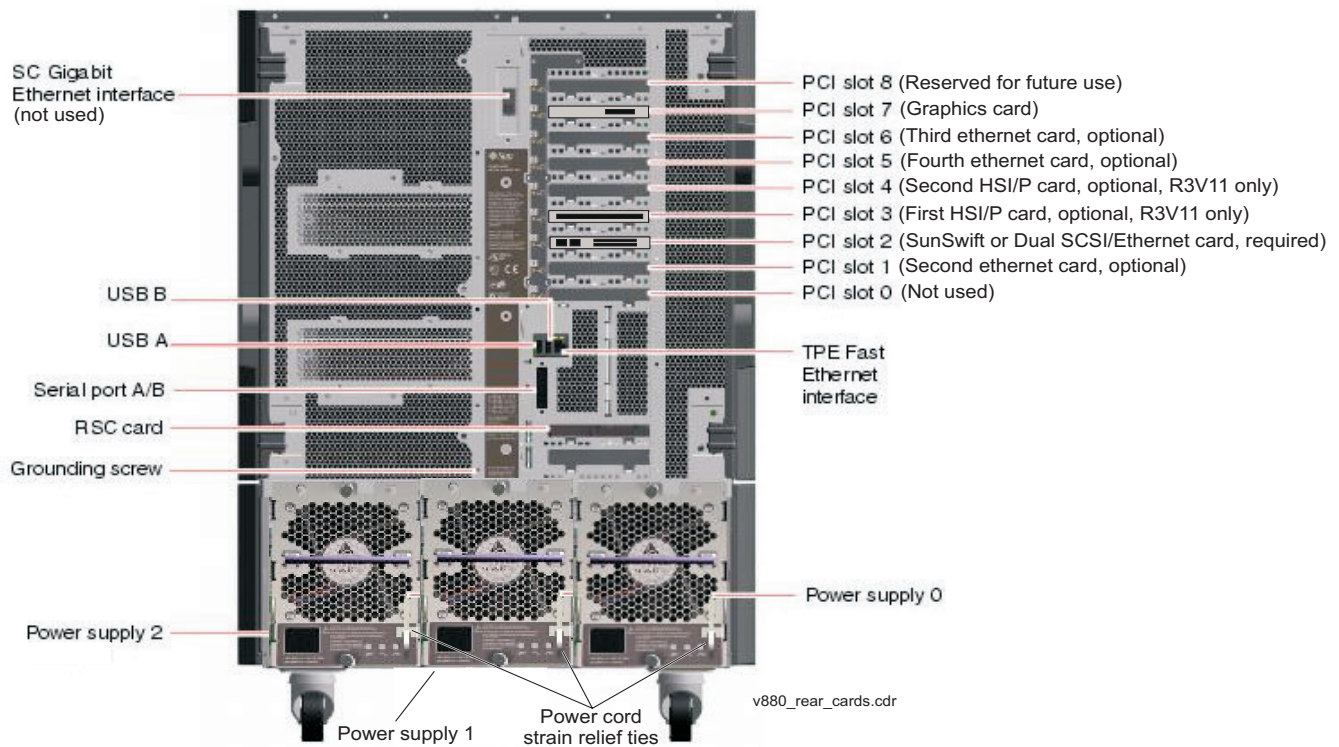
On earlier versions of the V880, the ethernet cards were installed in the following order:

Slots 0, 1, 2, and 5

Avaya now recommends that ethernet cards be installed in the following order:

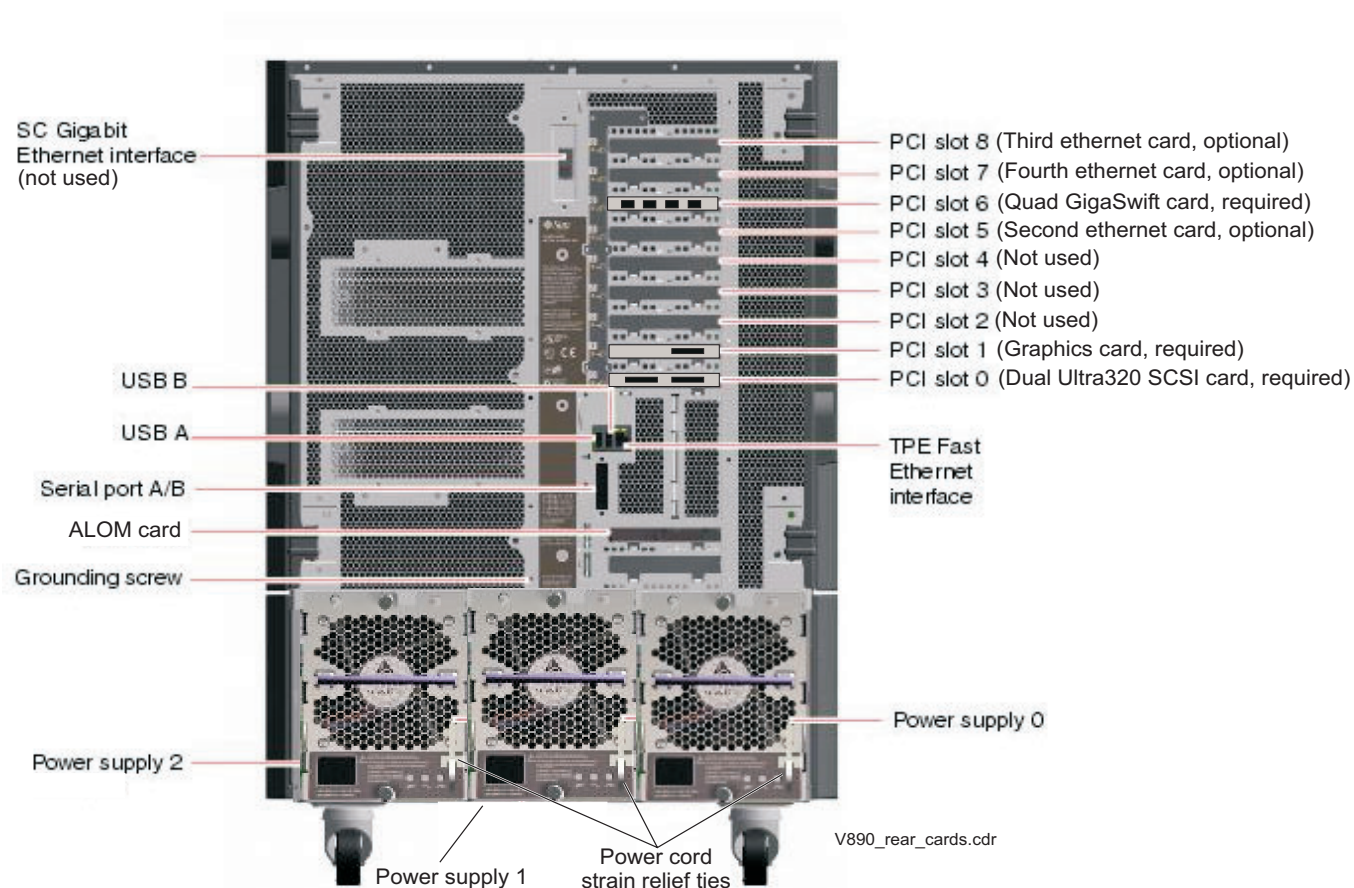
Slots 2, 1, 6, and 5

See [V880 PCI card configuration](#) on page 62 for more information.



## Rear panel - V890

The following figure shows the back panel of the V890 computer. The slots designated for optional ethernet cards can be either Quad GigaSwift ethernet cards or single Gigabit ethernet cards.



---

## Turning the computer off and on

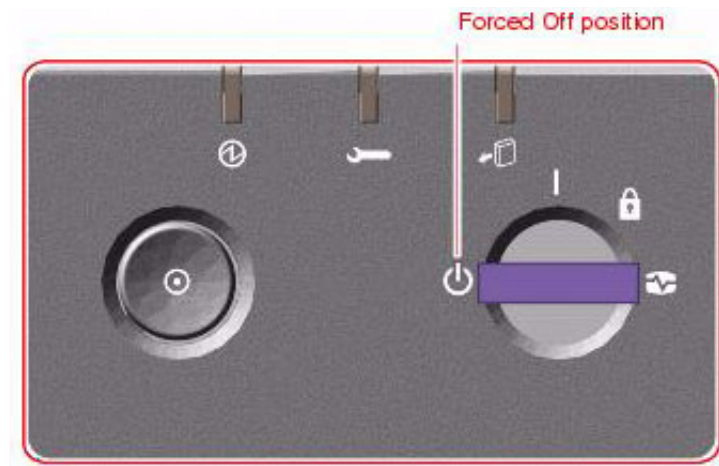
Use the following procedures to turn the computer off and on.

### To turn off the computer:

1. Log in to the system as root.
2. Enter:  

```
/usr/sbin/shutdown -y -i0 -g0
```

This shuts down the system. The `ok` prompt is displayed at the local console.
3. Press and release the front panel power button to turn off the system.  
Wait for the front panel Power/OK LED to turn off.
4. Turn the key switch to the Forced Off position. See the following figure.



### **DANGER:**

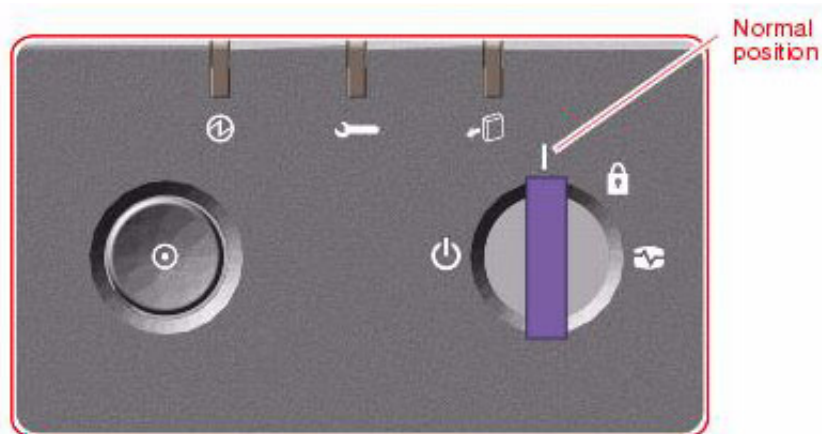
Be sure to turn the key switch to the Forced Off position before handling any internal components. Otherwise, it is possible for a user to restart the system remotely while you are working inside it. The Forced Off position is the only key switch position that prevents a Remote System Control (RSC) user from restarting the system.

5. Turn off the system monitor.
6. Turn off any external SCSI devices, starting with the device that is closest to the system and working toward the farthest device.



**To turn on the computer:**

1. Turn on any external SCSI devices, starting with the device that is farthest from the system and working toward the system.
2. Turn on the system monitor.
3. Turn the key switch to the normal On position. See the following figure.



4. Press and release the power button to the left of the key switch to turn on the system.

**Note:**

The POST diagnostics occurs each time that you turn on the system. The POST tests the basic system components. This may take several minutes.

If the system is operating properly, a banner screen is displayed within about 5 minutes after it is turned on.

5. Log in to the system as root.

---

## Accessing components inside the computer

For most of the maintenance procedures, you must open the side doors and, in some cases, remove the side doors.

This section includes the following topics:

- [Opening and removing a side door](#) on page 56
- [Replacing and closing a side door](#) on page 58

---

## Opening and removing a side door



### CAUTION:

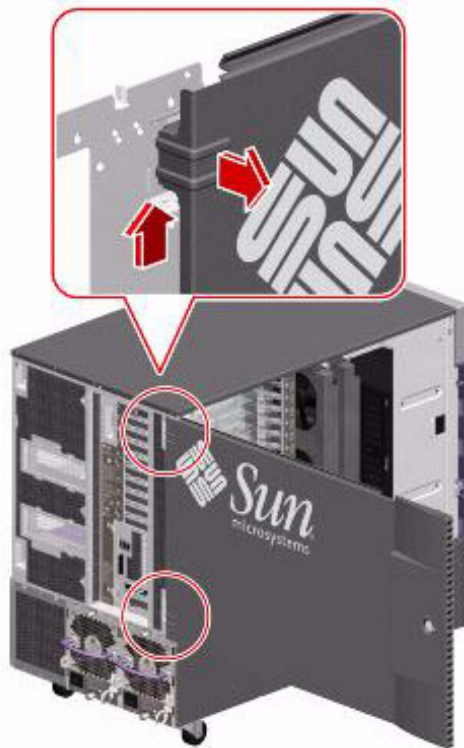
Avoid keeping doors open for extended periods of time while the system is operating. All doors must be closed to prevent automatic thermal shutdown.

To open and remove a side door:

1. Unlock the side door of the computer using the system key.
2. Swing the side door open.



3. Open the door 90 degrees and pull it up until the mounting pins clear the brackets on the rear panel. See the following figure.



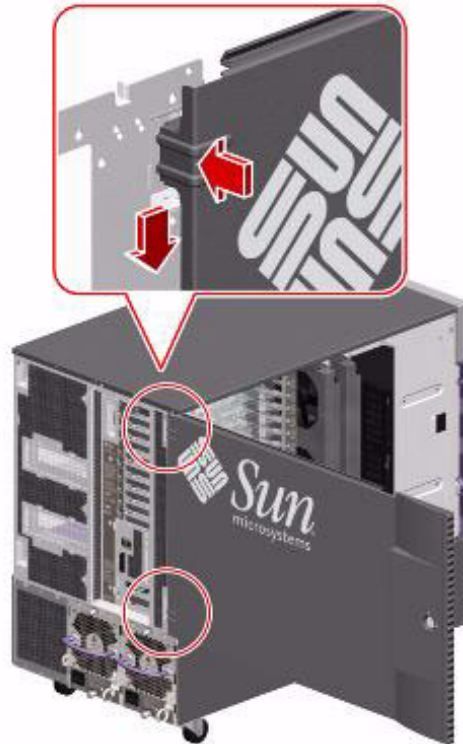
4. Set the door in a safe place.

---

## Replacing and closing a side door

To replace and close a side door:

1. Position the side door mounting pins over the corresponding holes in the chassis rear panel and lower the side door into place. See the following figure.



2. Close the side door.
3. Lock the side door of the computer using the system key.
4. Replace the system key to the key switch.

---

## Using an ESD wrist strap

Before you work on components inside the computer:

1. Unless otherwise instructed, make sure that the computer is plugged in to AC power.
2. Unless hot-plugging a device, make sure that the power is off.
3. Attach the ESD wrist strap to the chassis frame and to your wrist. See the following figure.



---

## Maintaining PCI cards

This section includes the following topics:

- [Required references](#) on page 60
- [Precautions](#) on page 61
- [PCI card configuration](#) on page 61
- [PCI card compatibility with CMS loads](#) on page 64
- [Maintaining hot-plug PCI cards](#) on page 65
- [Replacing the graphics card](#) on page 74
- [Installing the XVR-100 software packages \(V880 and R3V11 only\)](#) on page 78
- [Replacing SCSI cards](#) on page 79
- [Maintaining HSI/P cards \(R3V11 on V880 only\)](#) on page 83



### **WARNING:**

The graphics card, High-Speed Serial Interface/PCI (HSI/P) cards, and SCSI cards are not hot-pluggable cards. Before replacing these cards, you must turn off the computer. For information on how to replace the graphics card, see [Replacing the graphics card](#) on page 74. For information on how to replace SCSI cards, see [Replacing SCSI cards](#) on page 79. For information on how to install HSI/P cards, see [Maintaining HSI/P cards \(R3V11 on V880 only\)](#) on page 83.

---

## Required references

You need access to the following documents:

- *Sun Fire 880 Server Service Manual* or *Sun Fire V890 Server Service Manual* at the Sun documentation Web site:  
<http://docs.sun.com>
- The CMS software installation, maintenance, and troubleshooting document for your CMS release
- Avaya Call Management System Switch Connections, Administration, and Troubleshooting

---

## Precautions

**WARNING:**

The graphics card, High-Speed Serial Interface/PCI (HSI/P) cards, and SCSI cards are not hot-pluggable cards. Before replacing these cards, you must turn off the computer. For information on how to replace the graphics card, see [Replacing the graphics card](#) on page 74. For information on how to replace SCSI cards, see [Replacing SCSI cards](#) on page 79. For information on how to install HSI/P cards, see [Maintaining HSI/P cards \(R3V11 on V880 only\)](#) on page 83.

---

## PCI card configuration

The PCI card configurations are different for the V880 and V890 models. It is critical that you configure the cards as described in the following sections:

- [Reconfiguring PCI network cards](#) on page 61
- [V880 PCI card configuration](#) on page 62
- [V890 PCI card configuration](#) on page 63

## Reconfiguring PCI network cards

On earlier versions of the V880, the ethernet cards were installed in the following order:

Slots 0, 1, 2, and 5

Avaya now recommends that ethernet cards be installed as shown in [V880 PCI card configuration](#) on page 62. This is because the PCI card slots on both the V880 and V890 are scanned for network addressing in the following order:

Slots 3, 2, 1, 0, 6, 5, 4, 8, 7

Verify that the network cards are in the correct slot. If you are doing any maintenance on the system, such as doing a scheduled reboot or if you are restoring a system, you should take the opportunity to uninstall and reinstall the PCI cards in the correct order. When you do this, the cards will be reconfigured during the system reboot.

See [V880 PCI card configuration](#) on page 62 and [V890 PCI card configuration](#) on page 63 for the correct order for PCI cards.

## V880 PCI card configuration

The cards are installed in the slots shown in the following table. The minimum configuration has either a SunSwift card or a Dual FastEthernet and Dual SCSI card in Slot 2 and the graphics card in slot 7.



### Important:

On earlier versions of the V880, the ethernet cards were installed in the following order:

Slots 0, 1, 2, and 5

Avaya now recommends that ethernet cards be installed as shown in the following table:

Slot		Card		
Number	Type	Name	Supports hot-plug? <sup>1</sup>	Device type
8	33/66MHz, 3.3V	Reserved for future use	N/A	N/A
7	33/66MHz, 3.3V	Graphics (required)	No	N/A
6	33MHz, 5V	Third ethernet card <sup>2</sup> (optional)	Yes	ce
5	33MHz, 5V	Fourth ethernet card <sup>2</sup> (optional)	Yes	ce
4	33MHz, 5V	Second HSI/P <sup>3</sup> (optional)	No	N/A
3	33MHz, 5V	First HSI/P <sup>3</sup> (optional)	No	N/A
2	33MHz, 5V	SunSwift (required), or	No <sup>4</sup>	ce
		Dual FastEthernet and Dual SCSI (required)	No <sup>4</sup>	ce
1	33MHz, 5V	Second ethernet card <sup>2</sup> (optional)	Yes	ce
0	33MHz, 5V	Empty	N/A	N/A

- Hot-plug operation for a PCI card requires that the card have detach-safe drivers. If the card does not have detach-safe drivers, the system must be shut down to add, remove, or replace the card.
- The computer supports a maximum of four ethernet cards. The optional ethernet cards can be the FastEthernet, Quad GigaSwift, and single Gigabit ethernet cards.
- The computer supports a maximum of two HSI/P cards. The first card must be in Slot 3. CMS R12 and later does not support HSI/P cards and X.25.
- Some models of the SCSI cards support hot-plug operation, but Avaya recommends that you replace those cards while the system is powered down.

## V890 PCI card configuration

The cards are installed in the slots shown in the following table. The minimum configuration has a Dual Ultra320 SCSI card in slot 0, the graphics card in slot 1, and a Quad GigaSwift ethernet card in slot 6.

Slot		Card		
Number	Type	Name	Supports hot-plug? <sup>1</sup>	Device name
8	33/66MHz, 3.3V	Third ethernet card (optional) <sup>2</sup>	Yes <sup>3</sup>	ce
7	33/66MHz, 3.3V	Fourth ethernet card (optional) <sup>2</sup>	Yes <sup>3</sup>	ce
6	33MHz, 5V	Quad GigaSwift Ethernet (required) <sup>2</sup>	Yes <sup>3</sup>	ce
5	33MHz, 5V	Second ethernet card (optional) <sup>2</sup>	Yes <sup>3</sup>	ce
4	33MHz, 5V	Empty	N/A	N/A
3	33MHz, 5V	Empty	N/A	N/A
2	33MHz, 5V	Empty	N/A	N/A
1	33MHz, 5V	Graphics (required)	No	N/A
0	33MHz, 5V	Dual Ultra320 SCSI (required)	No <sup>4</sup>	N/A

1. Hot-plug operation for a PCI card requires that the card have detach-safe drivers. If the card does not have detach-safe drivers, the system must be shut down to add, remove, or replace the card.

2. The computer supports a maximum of four ethernet cards. The optional ethernet cards can be the Quad GigaSwift or single Gigabit ethernet cards. If your first three ethernet cards are all Quad GigaSwift cards (slots 6, 5, and 8), you cannot add a fourth card of any type in slot 7.

3. Solaris 9 patches 113068-04 and 110824-05 must be installed to support hot-plug operation.

4. The SCSI card supports hot-plug operation, but Avaya recommends that you replace those cards while the system is powered down.

---

## PCI card compatibility with CMS loads

There are software compatibility issues with the following PCI cards.

### HSI/P X.25 interface card

The HSI/P X.25 interface card is supported with CMS R3V9 and R3V11. It is not supported on CMS R12 or later.

### GigaSwift four port ethernet card

The GigaSwift 4444A four port ethernet card requires the following loads:

- CMS r3v12ca.d or later
- Any CMS R13 load

The GigaSwift 4445A four port ethernet card requires the following loads:

- CMS R3V11ai.b or later
- CMS r3v12ca.d or later
- CMS r13aa.k or later



---

## Maintaining hot-plug PCI cards

Some of the PCI cards used with the computer can be added, removed, or replaced without shutting down the computer. This procedure is called "hot-plugging" and uses a feature called "Dynamic Reconfiguration" that enables you to reconfigure system hardware while the system is running. The procedures in this section describe how to add and remove PCI cards that support hot-plug operation.

**Important:**

You cannot hot-plug a 33MHz PCI card into one of the 66 MHz PCI slots 7 or 8.

The following PCI cards support hot-plug operation:

- FastEthernet
- Quad GigaSwift Ethernet
- Single Gigabit Ethernet

**Tip:**

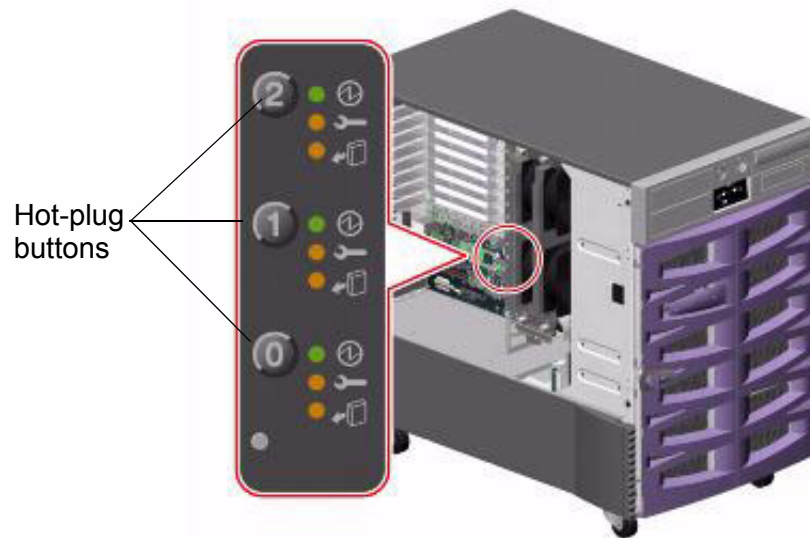
The hot-plug procedures are summarized on the inside panel of the left door.

This section includes the following topics:

- [PCI slot LEDs for hot-plug operation](#) on page 66
- [Preparing a hot-plug card for removal](#) on page 68
- [Removing a hot-plug PCI card](#) on page 68
- [Installing a hot-plug PCI card](#) on page 71
- [Configuring the new or replacement card](#) on page 73

## PCI slot LEDs for hot-plug operation




The PCI slot LEDs are located on the vertical bracket on the right side of the PCI slots and are visible when the left door is open. There is a hot-plug button and three LEDs for each PCI slot, as shown below.



The PCI slot LEDs are defined as follows:

Icon	Name	LED function
	Power on	Lights when the slot is receiving power.
	Fault	Blinks while the card is being tested, when a hot-plug operation is in progress, or when the card is turned on but logically detached from the operating system. Stays lit if the card encounters a fault.
	OK-to-Remove	Lights when it is safe to remove the card.  <b>⚠ Important:</b> If this LED stays lit after inserting a card, you must shut down the system, reinsert the card, and reboot the system. Consult the customer before you shut down the system.

The following table shows how to interpret the PCI slot LED patterns.

Icon			Interpretation
			
Off	Off	Off	The slot power is off. A card can be safely inserted to start a hot-plug operation.
On	Blinking	Off	The installed card is being tested, configured, or unconfigured, or the card is turned on but logically detached from the operating system.
On	Off	Off	The slot power is on and the card is operating normally.
Off	On	On	The PCI card has encountered a fault. The card can be safely removed.
Off	Off	On	The card can be safely removed.

## Preparing a hot-plug card for removal

Before you remove a hot-plug card, you must verify that the devices residing on the card are not currently in use. In most cases, the card you are removing is faulty and not operating, but you must still first check to make sure the card is not in use by the operating system.

To prepare a hot-plug card for removal:

1. Enter:

```
cfgadm
```

This displays the PCI card configuration before you remove a card. Check the **Condition** column for cards that are displaying **failed**, **failing**, or **unusable** status.

2. Enter:

```
ifconfig -a
```

Information similar to the following is displayed:

```
le0: flags=1000849<UP,LOOPBACK,RUNNING,MULTICAST,IPv4> mtu 8232 index 1
    inet 127.0.0.1 netmask ff000000
eri0: flags=1000843<UP,BROADCAST,RUNNING,MULTICAST,IPv4> mtu 1500 index 2
    inet 135.9.88.83 netmask ffffffff broadcast 135.9.88.255
    ether 0:3:ba:a:fe:85
```

The example above shows one administrable ethernet devices. Device **eri0** represents the built-in ethernet port.

3. When you determine which device you are removing, enter the following commands:

```
ifconfig <device> down
```

```
ifconfig <device> unplumb
```

Where **<device>** is the device displayed with **ifconfig -a**.

4. Continue with [Removing a hot-plug PCI card](#) on page 68.

## Removing a hot-plug PCI card

To remove a card:

1. Make sure that the front panel key switch is *not* in the locked position. If it is, move the key switch to the diagnostic or normal position.
2. Open the left door.
3. Attach one end of an ESD antistatic wrist strap to the system chassis sheet metal and attach the other end to your wrist. See [Using an ESD wrist strap](#) on page 59 for more information.
4. Identify which card you want to remove.
5. Disconnect the external cables connected to the card.

**⚠ Important:**

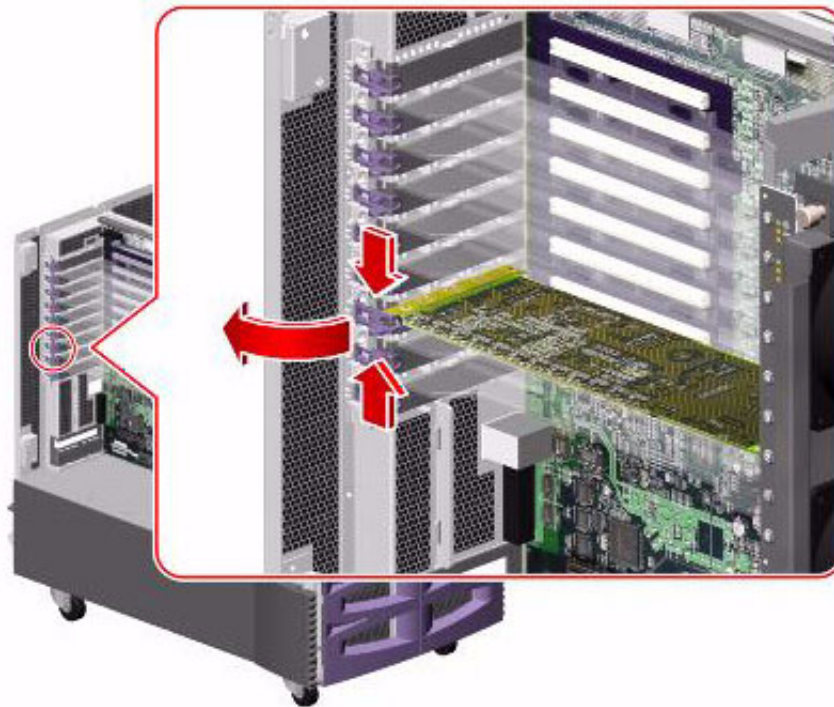
If you are removing the ethernet cards to rearrange them in the correct order (see [Reconfiguring PCI network cards](#) on page 61 for more information), label the network cables so you can reconnect them to the correct network cards and ports.

6. Press the hot-plug button for the card you are removing.  
The Fault LED for the slot blinks while the card is being unconfigured.
7. When the OK-to-Remove LED lights, the card can be removed from the computer.

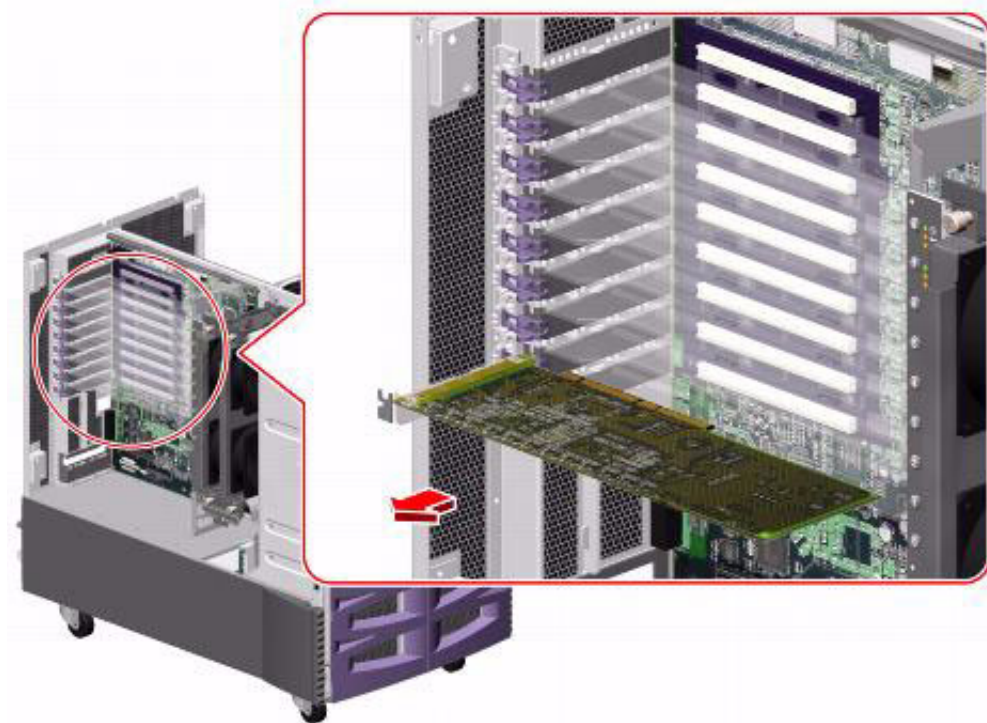
**⚠ CAUTION:**

Do not remove the card until the OK-to-Remove LED lights. If you remove the card when the OK-to-Remove LED is off, the system will fail.

8. Pinch the purple PCI card retaining clip until it releases from the back of the card and rotate the clip outward. See the following figure.



- Carefully pull the card from the I/O board. See the following figure.



- A message similar to the following is displayed in the console window:

```
Jun  6 12:55:24 sys_name picld[98]: Device PCI1_CARD removed
```

- Place the card on an antistatic mat or in an antistatic bag.
- Do one of the following:
  - If you are replacing the card, continue with [Installing a hot-plug PCI card](#) on page 71.
  - If you are not replacing the card, install a filler panel into the system rear panel, rotate the purple PCI retaining clip over the back of the filler panel until it snaps into place, remove the ESD wrist strap, close the side door, and return the key switch to its original position.

## Installing a hot-plug PCI card

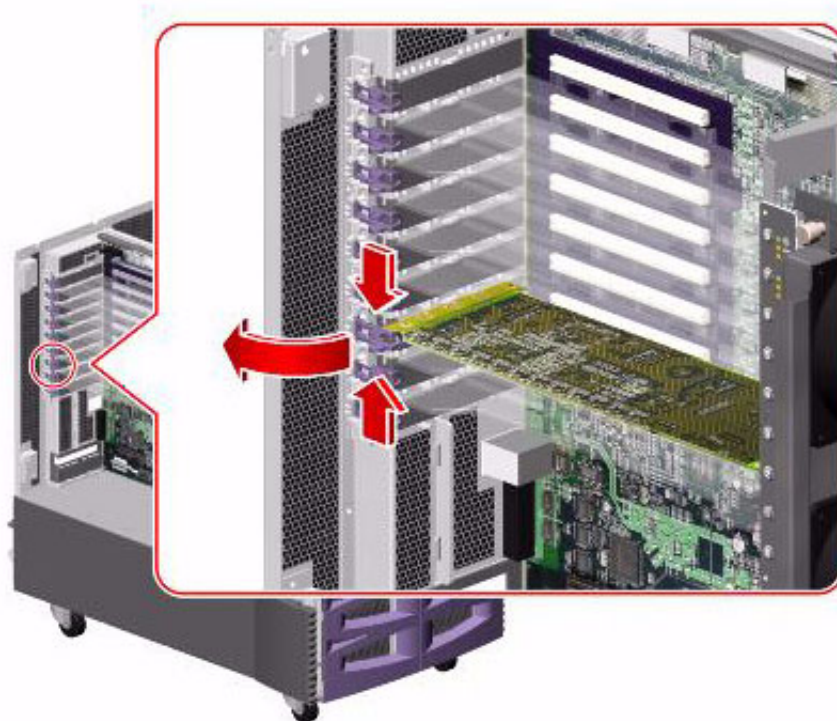
To install a card:

1. Enter:

**cfgadm**

This displays the PCI card configuration before you add a card. Make sure the slot is available for a new card. Recheck the configuration after you have added the card.

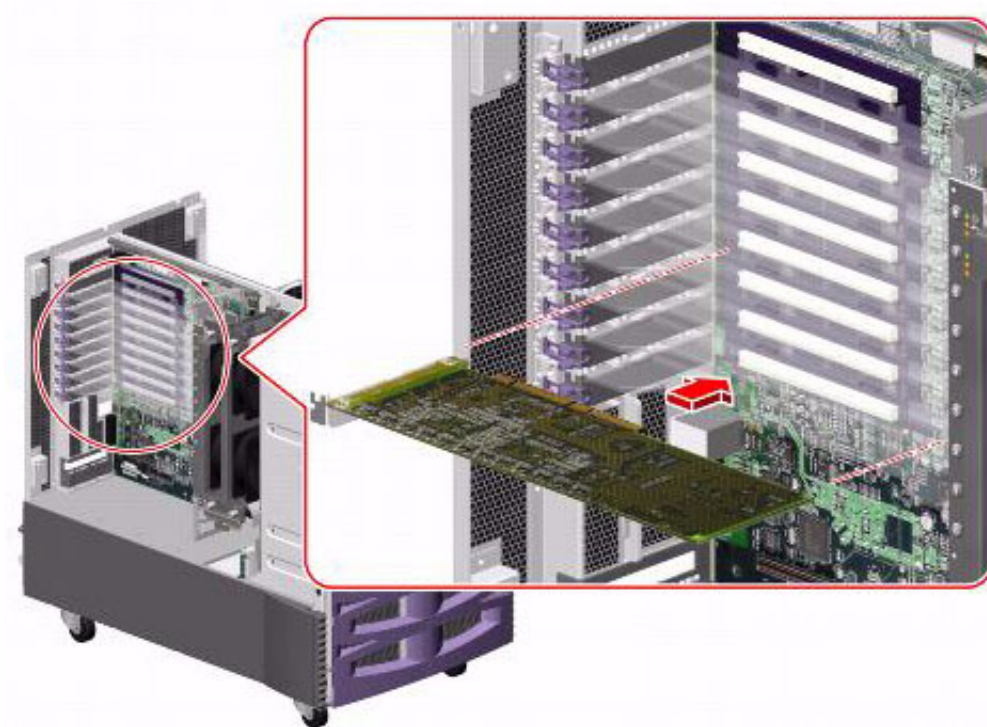
2. Make sure that the front panel key switch is *not* in the locked position. If it is, move the key switch to the diagnostic or normal position.
3. Open the left door.
4. Attach one end of an ESD antistatic wrist strap to the system chassis sheet metal and attach the other end to your wrist. See [Using an ESD wrist strap](#) on page 59 for more information.
5. Identify the slot in which you want to install a card.
6. If not already done, pinch the purple PCI card retaining clip until it releases from the back of the card and rotate the clip outward. See the following figure.



7. If not already done, remove the filler panel from the slot.
8. Confirm that all three LEDs for the slot are off.



9. Insert the PCI card into the slot on the I/O board. Make sure that the card is fully seated. See the following figure.



When the card is inserted, the amber OK-to-Remove LED lights and a message similar to the following is displayed on the console window:

```
Jun  6 12:55:24 sys_name picld[98]: Device PCI1_CARD inserted
```

10. Rotate the purple PCI retaining clip over the back of the card faceplate until it snaps into place.
11. Press the hot-plug button for the card you are installing.

After the button is pressed, the following should occur:

- The amber Fault LED for the slot may blink briefly and then turn off.
- The green Power LED lights.
- A message similar to the following is displayed on the console window:

```
Jun  6 12:57:11 sys_name pcihp: NOTICE: pcihp (pcisch0): card is powered on in the slot  
hpc1_slotX
```



### Important:

If the Fault LED remains lit after inserting a card, you must shut down the system, reinsert the card, and reboot the system.



12. Connect the external cables to the card.



**Important:**

If you are installing the ethernet cards to rearrange them in the correct order (see [Reconfiguring PCI network cards](#) on page 61 for more information), label the network cables so you can reconnect them to the correct network cards and ports.

13. Remove the ESD wrist strap.
14. Return the key switch to its original position.
15. Close the side door.

## Configuring the new or replacement card

After you install a new or replacement card, do the following to configure the card:

1. Enter:

```
cfgadm
```

This displays the PCI card configuration after you add a card. Make sure the new card is displayed.

2. Set up the network interface using the procedures in "Setting up LAN connections" in the software installation chapter of the CMS software installation, maintenance, and troubleshooting document for your CMS release.
3. Enter the following commands:

```
ifconfig <device> plumb
```

```
ifconfig <device> inet <IP_address> netmask 255.255.255.0  
broadcast + up
```

Where:

- **<device>** is the device name
  - **<IP\_address>** is the IP address being assigned to the card
4. Perform a CMSADM file system backup to back up the updated system configuration. See your CMS software installation, maintenance, and troubleshooting document for details.

---

## Replacing the graphics card

The graphics card provides an interface for the local monitor.



**Important:**

The graphics card does *not* support hot-plug operation. You must shut down the system and turn off power before installing or replacing a card.

To replace a graphics card:

1. Log in to the system as root.
2. Enter:

```
cfgadm
```

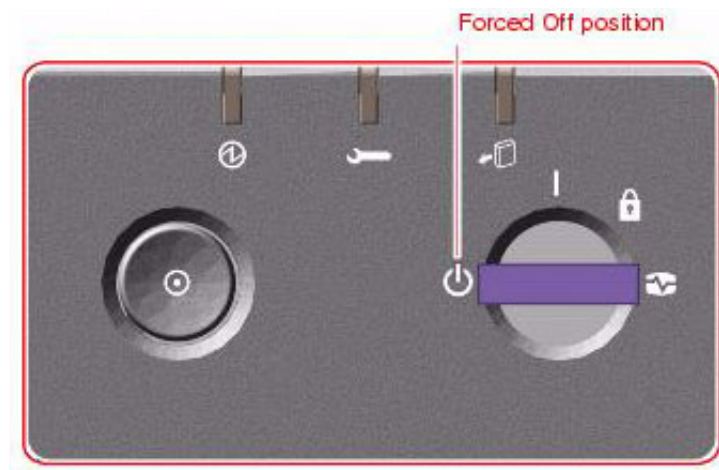
This displays the PCI card configuration before you replace a card. Recheck the configuration after you have replaced the card.

3. Enter:

```
/usr/sbin/shutdown -y -i0 -g0
```

This shuts down the system.

4. Press and release the front panel power button to turn off the system.  
Wait for the front panel Power/OK LED to turn off.
5. Turn the key switch to the Forced Off position. See the following figure.

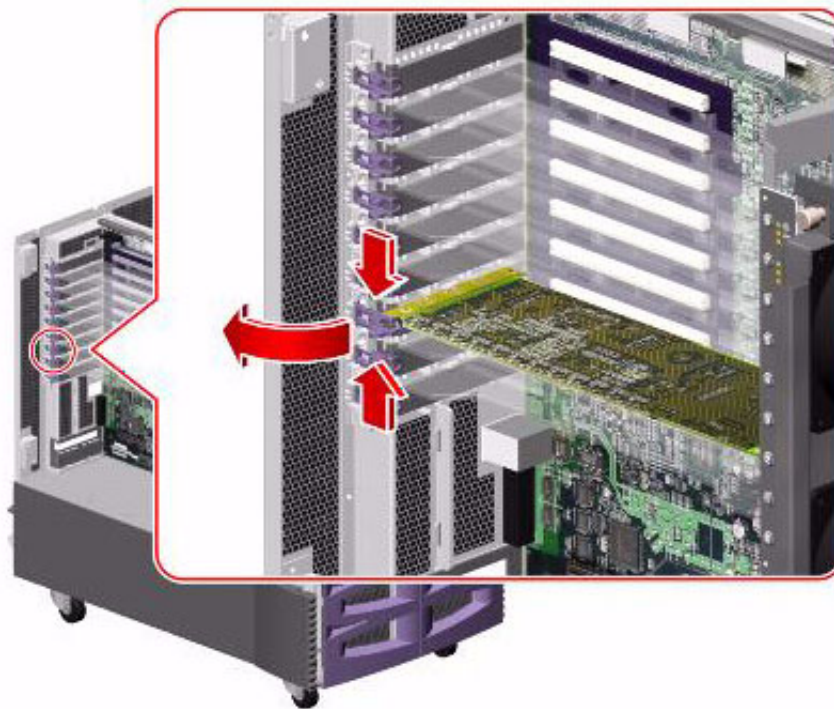




**DANGER:**

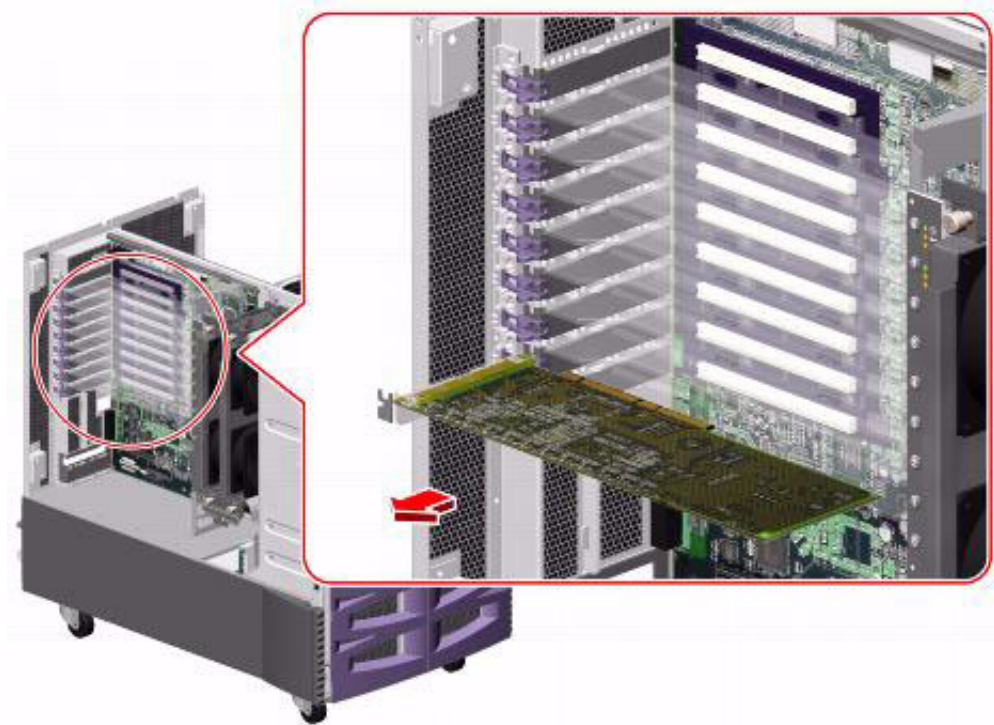
Be sure to turn the key switch to the Forced Off position before handling any internal components. Otherwise, it is possible for a user to restart the system remotely while you are working inside it. The Forced Off position is the only key switch position that prevents an RSC user from restarting the system.

6. Open the left door.
7. Attach one end of an ESD antistatic wrist strap to the system chassis sheet metal and attach the other end to your wrist. See [Using an ESD wrist strap](#) on page 59 for more information.
8. Disconnect the monitor cable connected to the card.
9. Pinch the purple PCI card retaining clip until it releases from the back of the card and rotate the clip outward. See the following figure.



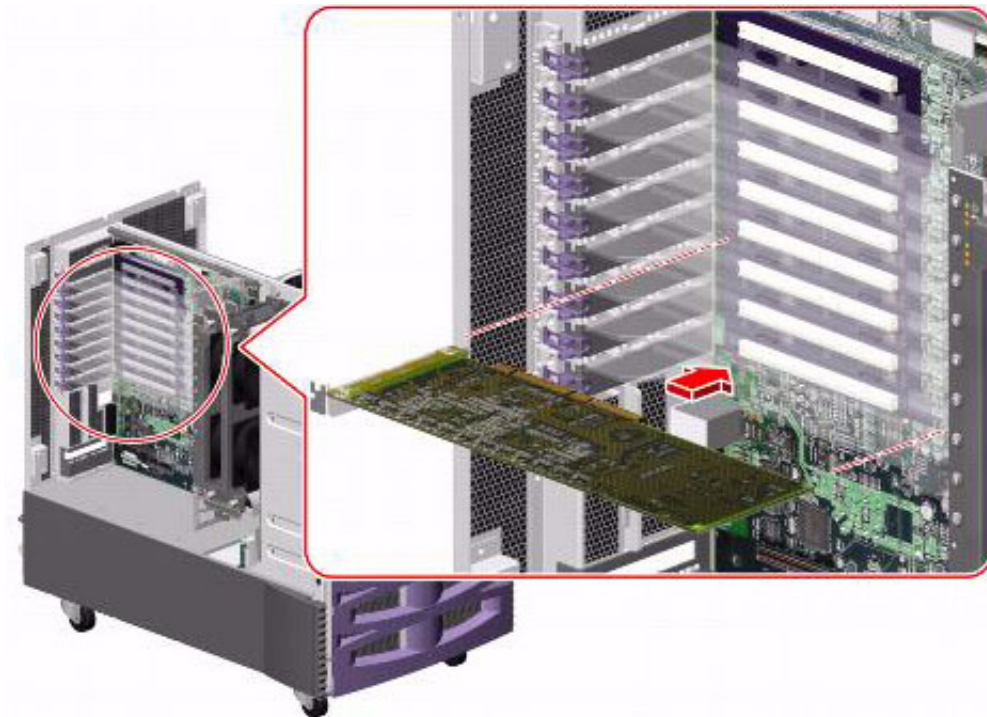
## Maintenance

10. Carefully pull the card from the I/O board. See the following figure.



11. Place the card on an antistatic mat or in an antistatic bag.

12. Insert the new graphics card into the slot on the I/O board. Make sure that the card is fully seated. See the following figure.



13. Rotate the purple PCI retaining clip over the back of the card faceplate until it snaps into place.
14. Connect the monitor cable to the card.
15. Remove the ESD wrist strap.
16. Close the left door.
17. Reattach the monitor cable.
18. Turn on any external SCSI devices, starting with the device that is farthest from the system and working toward the system.
19. Turn on the system monitor.
20. Turn on the system.
21. When the system comes back up, log in as root.
22. Enter:

**cfgadm**

This displays the PCI card configuration after you replace the card. Make sure that the new card is displayed.

23. If you just installed an XVR-100 graphics accelerator card on a CMS R3V11 V880, continue with [Installing the XVR-100 software packages \(V880 and R3V11 only\)](#) on page 78.

---

## Installing the XVR-100 software packages (V880 and R3V11 only)

The XVR-100 software packages must be installed after you install a new XVR-100 graphics accelerator card. If you are replacing an existing XVR-100 graphics accelerator card, you do not have to reinstall this software.

To install the XVR-100 software packages on a Sun Fire V880 system:

1. Verify that your CMS system is running CMS R3V11 by entering:

```
pkginfo -x cms
```

**Note:**

Do not perform this procedure if your CMS system is running a later load of CMS. The software packages were installed with the Solaris operating system.

2. Verify that the XVR-100 graphics accelerator card is installed.

**Note:**

For information on how to install the XVR-100 graphics accelerator card, see the Sun documentation that was shipped with the card.

3. Load the *Sun XVR-100 FCS* software disk into the disk drive.
4. Enter:

```
cd /cdrom/cdrom0
```

5. Enter:

```
./install
```

The system installs the SUNWpfbx.u, SUNWpfbcf, SUNWpfbw, and SUNWpfbmn packages.

6. Enter:

```
/usr/sbin/shutdown -y -i0 -g0
```

The system shuts down and displays the **ok** prompt.

7. Enter:

```
boot -r
```

8. Log into the system as **root**.

The system reboots and displays the **#** prompt.

9. Enter:

```
eject cdrom
```



---

## Replacing SCSI cards

The following cards that support SCSI connections can be found in the V880 and V890 computers:

- Dual Ethernet and Dual SCSI card (V880 only)
- SunSwift SCSI card (V880 only)
- Dual Ultra320 SCSI card (V890 only)

To replace any of these SCSI cards:

1. Log in to the system as root.
2. Enter:

```
cfgadm
```

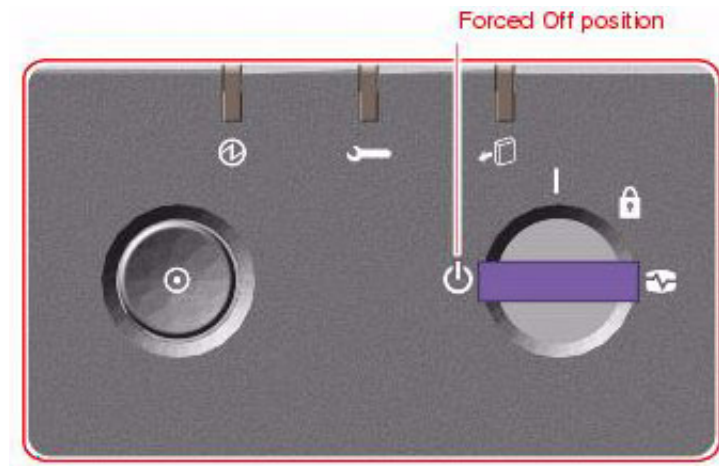
This displays the PCI card configuration before you replace a card. Recheck the configuration after you have replaced the card.

3. Enter:

```
/usr/sbin/shutdown -y -i0 -g0
```

This shuts down the system.

4. Press and release the front panel power button to turn off the system.  
Wait for the front panel Power/OK LED to turn off.
5. Turn the key switch to the Forced Off position. See the following figure.

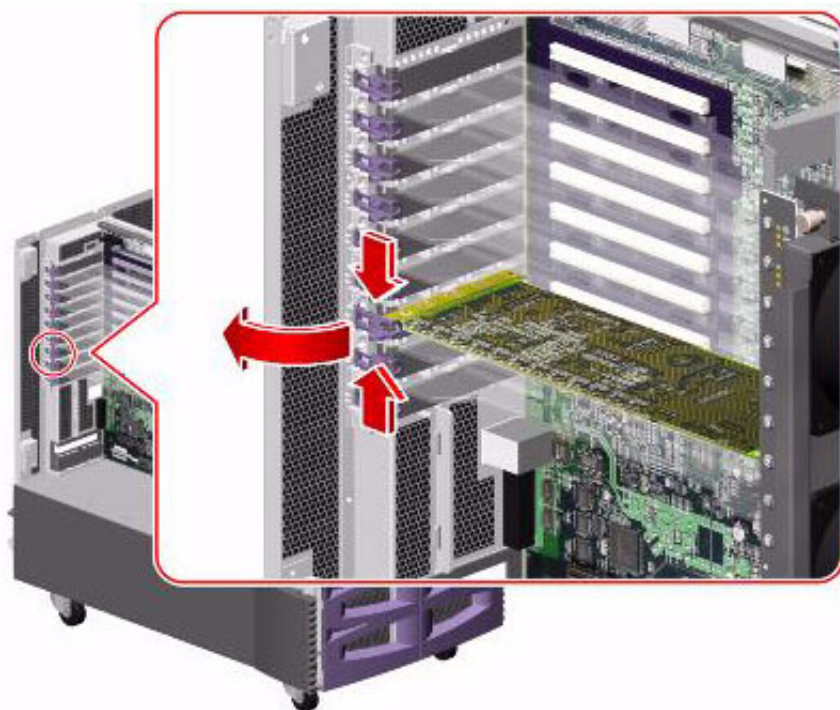




### **DANGER:**

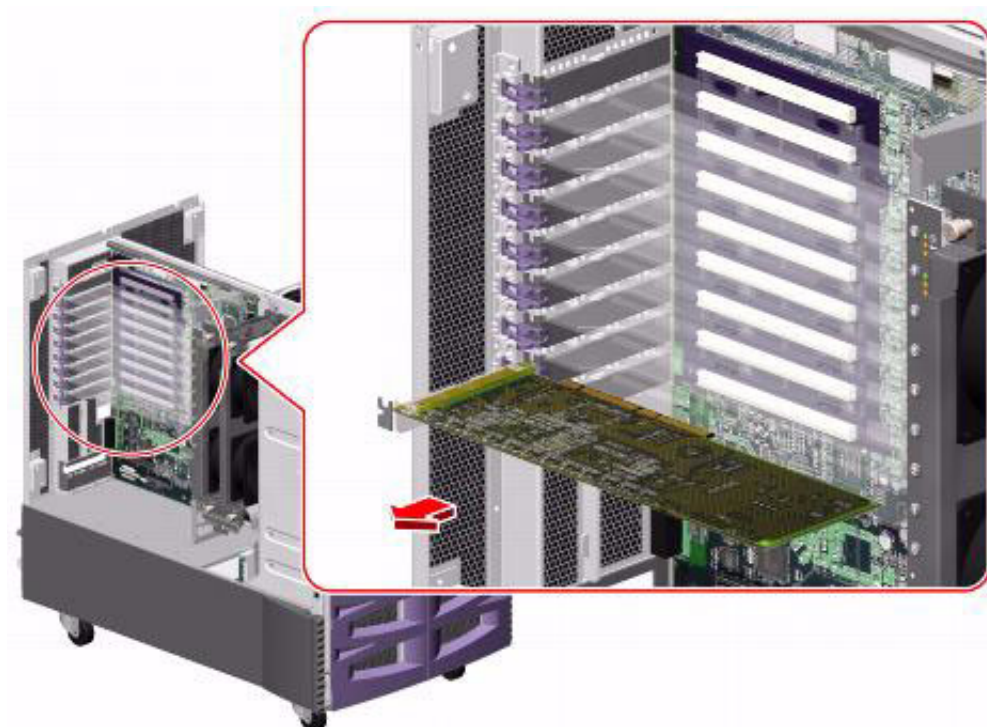
Be sure to turn the key switch to the Forced Off position before handling any internal components. Otherwise, it is possible for a user to restart the system remotely while you are working inside it. The Forced Off position is the only key switch position that prevents an RSC user from restarting the system.

6. Open the left door.
7. Attach one end of an ESD antistatic wrist strap to the system chassis sheet metal and attach the other end to your wrist. See [Using an ESD wrist strap](#) on page 59 for more information.
8. Identify which card you want to remove.
9. Disconnect and label the cables connected to the card.
10. For the Dual Ultra320 SCSI card on the V890 only, disconnect the internal SCSI cable from the card.
11. Pinch the purple PCI card retaining clip until it releases from the back of the card and rotate the clip outward. See the following figure.





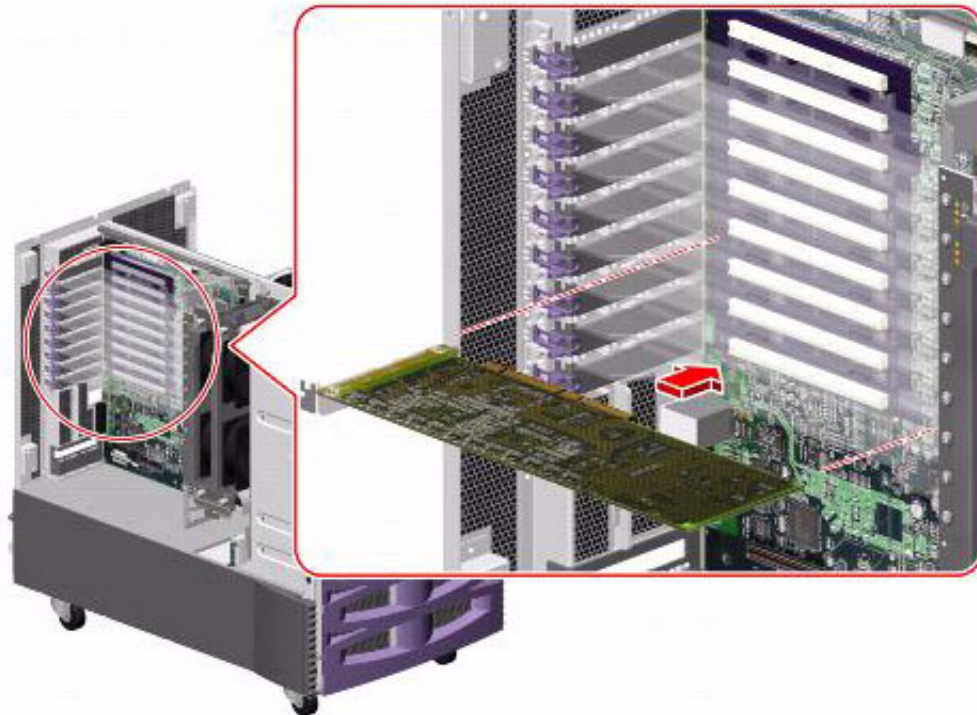
12. Carefully pull the card from the I/O board. See the following figure.



13. Place the card on an antistatic mat or in an antistatic bag.

## Maintenance

14. Insert the new SCSI card into the slot on the I/O board. Make sure that the card is fully seated. See the following figure.



15. Rotate the purple PCI retaining clip over the back of the card faceplate until it snaps into place.
16. For the Dual Ultra320 SCSI card on the V890 only, reattach the internal SCSI cable to the card.
17. Remove the ESD wrist strap.
18. Close the left door.
19. Reattach the cables.
20. Turn on any external SCSI devices, starting with the device that is farthest from the system and working toward the system.
21. Turn on the system monitor.
22. Turn on the system.
23. When the system comes back up, log in as root.
24. Enter:

**cfgadm**

This displays the PCI card configuration after you replace the card. Make sure that the new card is displayed.

---

## Maintaining HSI/P cards (R3V11 on V880 only)

An HSI/P card supports X.25 switch links. For eight links, two HSI/P cards and two quad cables are needed. If the system uses TCP/IP signaling for all links, HSI/P cards are not needed. HSI/P cards are not supported for CMS R12 and later.

**Important:**

The HSI/P card does *not* support hot-plug operation. You must shut down the system and turn off power before installing or replacing a card.

This section includes the following topics:

- [Replacing an HSI/P card](#) on page 83
- [Installing the first HSI/P card or a pair of HSI/P cards](#) on page 88
- [Installing HSI/P software and patches](#) on page 91
- [Setting up the switch link for each ACD](#) on page 91
- [Adding a second HSI/P card](#) on page 93

If you are replacing a defective HSI/P card, see [Replacing an HSI/P card](#) on page 83. If this is the initial installation of one or two HSI/P cards, start with [Installing the first HSI/P card or a pair of HSI/P cards](#) on page 88. If a second HSI/P card is being added to a system already in operation, see [Adding a second HSI/P card](#) on page 93.

## Replacing an HSI/P card

To replace an HSI/P card:

1. Log in to the system as root.
2. Enter:

```
cfgadm
```

This displays the PCI card configuration before you replace a card. Recheck the configuration after you have replaced the card.

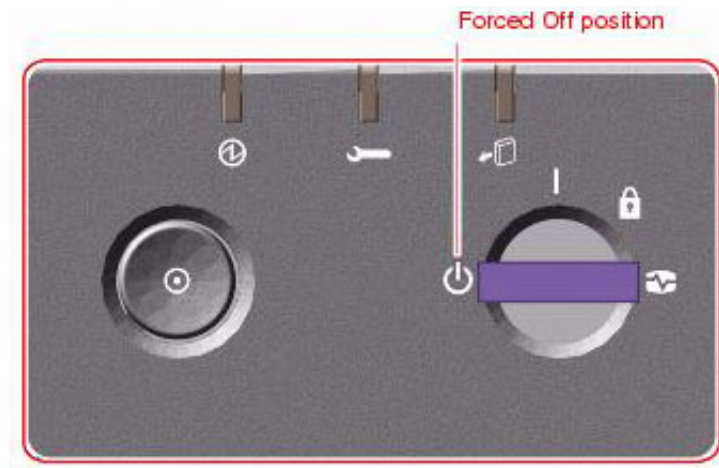
3. Enter:

```
/usr/sbin/shutdown -y -i0 -g0
```

This shuts down the system.

4. Press and release the front panel power button to turn off the system.  
Wait for the front panel Power/OK LED to turn off.

5. Turn the key switch to the Forced Off position. See the following figure.

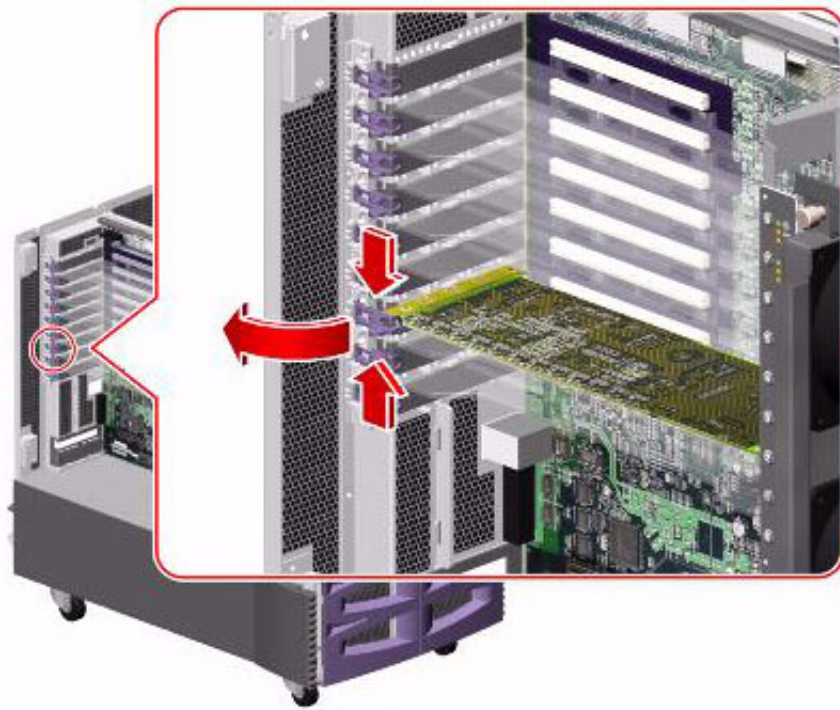


### **DANGER:**

Be sure to turn the key switch to the Forced Off position before handling any internal components. Otherwise, it is possible for a user to restart the system remotely while you are working inside it. The Forced Off position is the only key switch position that prevents an RSC user from restarting the system.

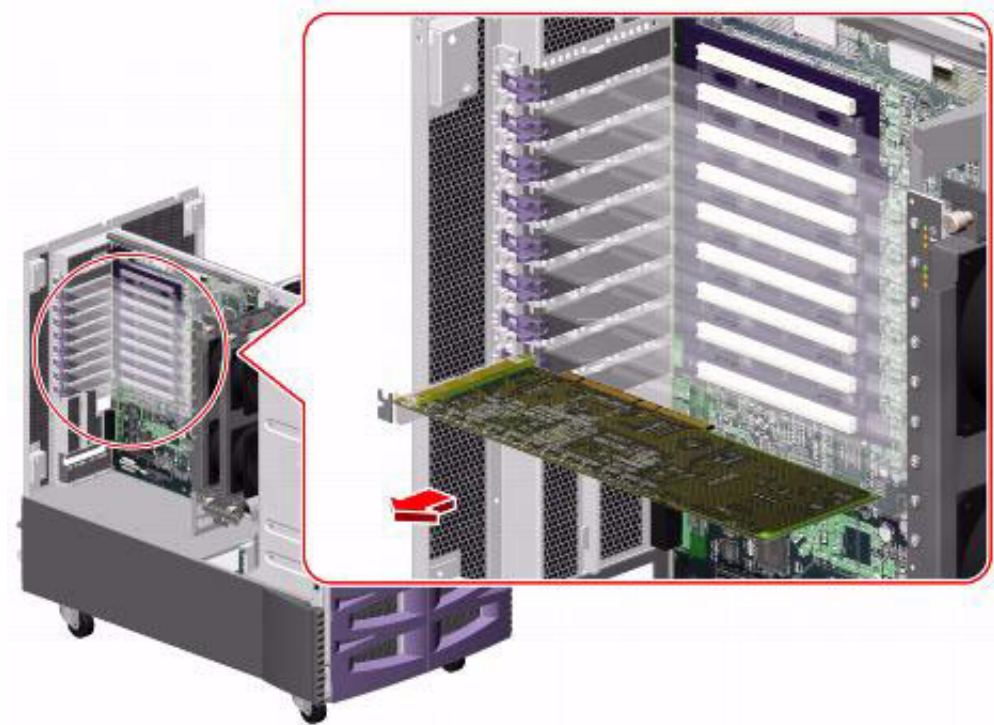
6. Open the left door.
7. Attach one end of an ESD antistatic wrist strap to the system chassis sheet metal and attach the other end to your wrist. See [Using an ESD wrist strap](#) on page 59 for more information.
8. Identify which card you want to remove.
9. Disconnect the HSI/P quad cable connected to the card.

10. Pinch the purple PCI card retaining clip until it releases from the back of the card and rotate the clip outward. See the following figure.



## Maintenance

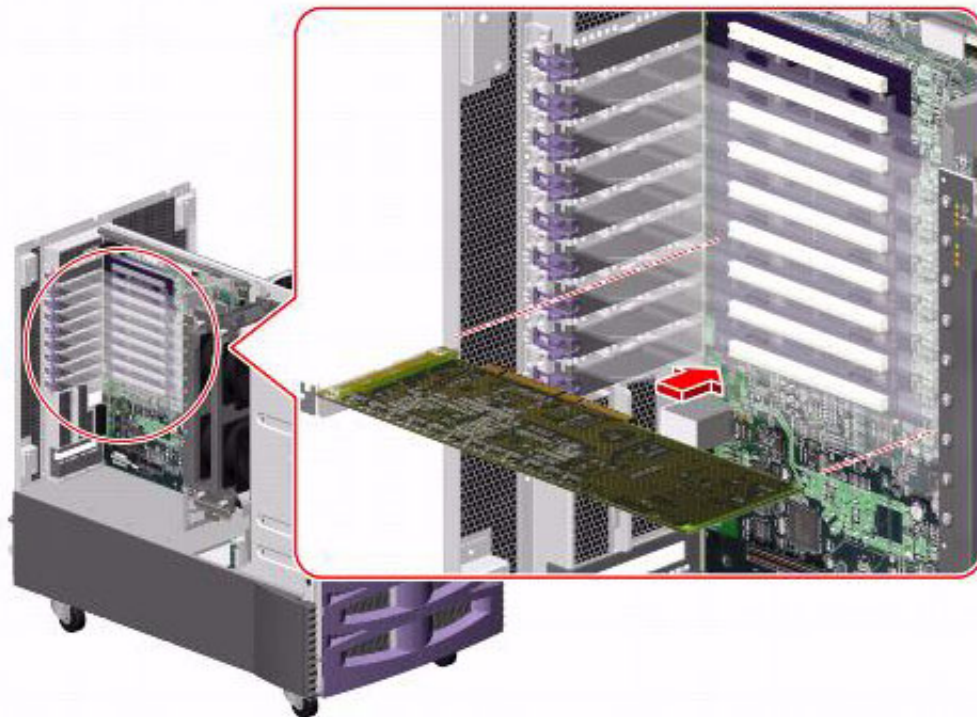
11. Carefully pull the card from the I/O board. See the following figure.



12. Place the card on an antistatic mat or in an antistatic bag.



13. Insert the new HSI/P card into the slot on the I/O board. Make sure that the card is fully seated. See the following figure.



14. Rotate the purple PCI retaining clip over the back of the card faceplate until it snaps into place.
15. Remove the ESD wrist strap.
16. Close the left door.
17. Reattach the HSI/P quad cable.
18. Turn on any external SCSI devices, starting with the device that is farthest from the system and working toward the system.
19. Turn on the system monitor.
20. Turn on the system.
21. When the system comes back up, log in as root.
22. Enter:

**cfgadm**

This displays the PCI card configuration after you replace the card. Make sure that the new card is displayed.

## Installing the first HSI/P card or a pair of HSI/P cards

To install the first HSI/P card or a pair of HSI/P cards:

1. Verify that you have a recent CMSADM file system backup before you change card configurations.
2. Log in to the system as root.
3. Enter:

```
cfgadm
```

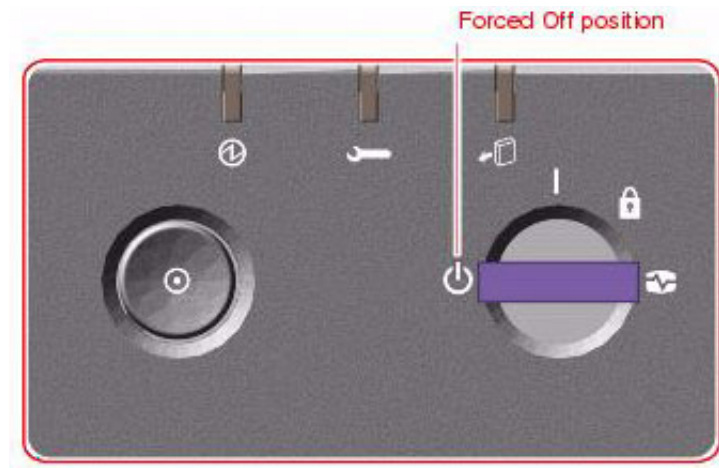
This displays the PCI card configuration before you add a card. Recheck the configuration after you have added the card.

4. Enter:

```
/usr/sbin/shutdown -y -i0 -g0
```

This shuts down the system.

5. Press and release the front panel power button to turn off the system.  
Wait for the front panel Power/OK LED to turn off.
6. Turn the key switch to the Forced Off position. See the following figure.



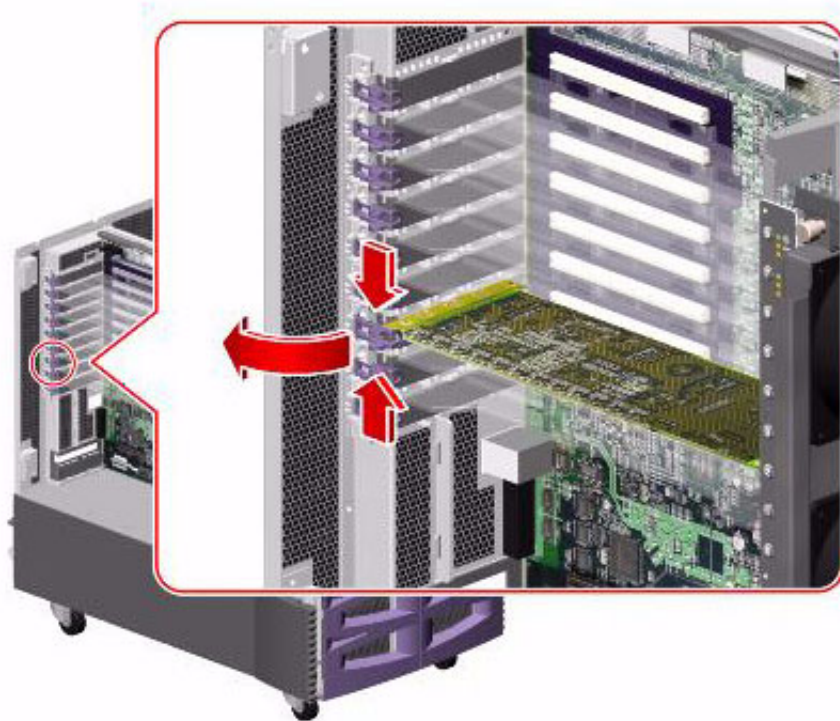
**⚠ DANGER:**

Be sure to turn the key switch to the Forced Off position before handling any internal components. Otherwise, it is possible for a user to restart the system remotely while you are working inside it. The Forced Off position is the only key switch position that prevents an RSC user from restarting the system.

7. Turn off the system monitor.
8. Turn off any external SCSI devices, starting with the device that is closest to the system and working toward the farthest device.

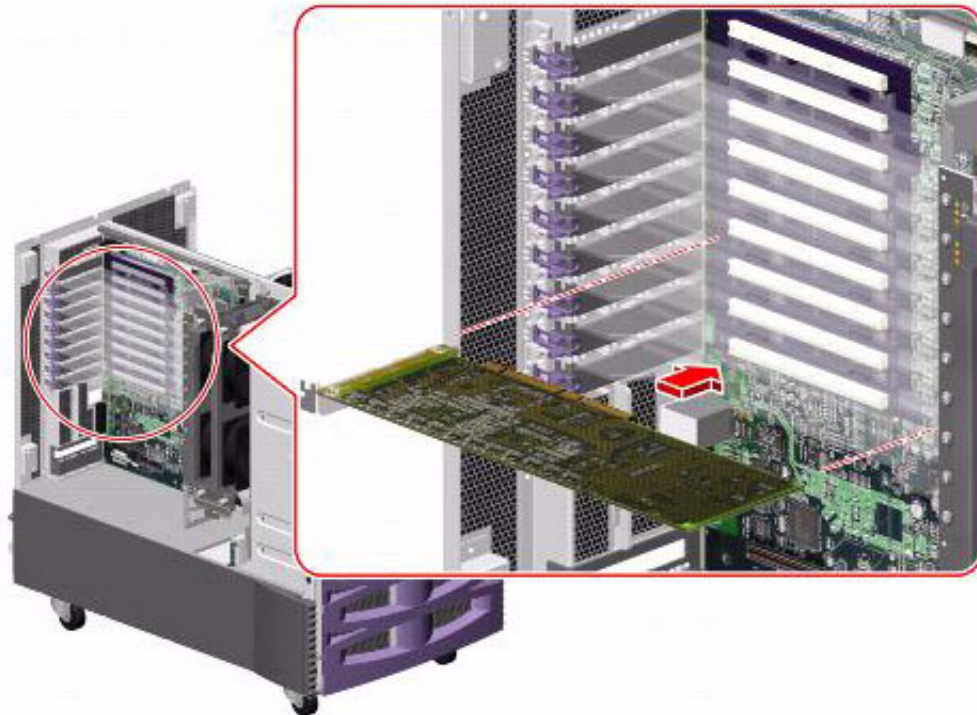


9. Open the left door.
10. Attach one end of an ESD antistatic wrist strap to the system chassis sheet metal and attach the other end to your wrist. See [Using an ESD wrist strap](#) on page 59 for more information.
11. Identify the slot in which you want to install the HSI/P cards. Slot 3 is recommended for the first HSI/P card and slot 4 is recommended for the second HSI/P card.
12. Pinch the purple PCI card retaining clip until it releases from the back of the card and rotate the clip outward. See the following figure.



13. Remove the filler panel from the slot.

14. Insert the first HSI/P card into slot 3 on the I/O board. Make sure that the card is fully seated. See the following figure.



15. Rotate the purple PCI retaining clip over the back of the card faceplate until it snaps into place.
16. If installing a second HSI/P card in slot 4, repeat Steps 12 through 15.
17. Remove the ESD wrist strap.
18. Close the left door.
19. Attach the HSI/P quad cables, and connect the switch links to the quad cables by following the instructions described in *Avaya Call Management System Switch Connections, Administration, and Troubleshooting*.
20. Turn on any external SCSI devices, starting with the device that is farthest from the system and working toward the system.
21. Turn on the system monitor.
22. Turn on the system. Do *not* put the key switch in the locked position.  
As the system powers up, the power LED on the monitor flashes.
23. Press **Stop+A** simultaneously as soon as the monitor power LED lights steadily and the Sun logo is displayed on the monitor.  
The **ok** prompt is displayed.

24. Enter:

```
boot -r
```

This reboots the system so that it recognizes the new HSI/P cards.

**Note:**

Sometimes the system fails to recognize a newly installed HSI card. If this happens, the command **show-devs** does not show the HSI card and **/var/adm/messages** fails to recognize the card upon bootup. See the troubleshooting chapter of *Avaya Call Management System Switch Connections, Administration, and Troubleshooting* for information about troubleshooting HSI/P cards.

25. When the system comes back up, log in as root.

26. Enter:

```
cfgadm
```

This displays the PCI card configuration after you add the card. Make sure that the new card is displayed.

27. Continue with [Installing HSI/P software and patches](#) on page 91.

## Installing HSI/P software and patches

Use the following procedures in the CMS software installation, maintenance, and troubleshooting document to:

- Install the HSI/P software
- Reinstall the Solaris patches

After installing the software and patches, continue with [Setting up the switch link for each ACD](#) on page 91

## Setting up the switch link for each ACD

To change the switch link administration for each ACD:

1. Enter:

```
cmssvc
```

The CMS Services menu is displayed.

2. Select the **run\_cms** option.

3. Turn off CMS.

4. Enter:

```
cmssvc
```

The CMS Services menu is displayed.

5. Select the **swsetup** option.

6. Select the ACD that you want to set up.
7. Accept the existing defaults for the following:
  - Switch name
  - Switch model (release)
  - Vectoring
  - Expert agent
  - Central office disconnect supervision
  - Local port
  - Remote port
8. Select "X.25" and a specific link number when prompted for the link information.
9. Repeat Steps 4 through 8 for each ACD that will use the HSI card.
10. Enter:  
**cmssvc**  
The CMS Services menu is displayed.
11. Select the **run\_cms** option.
12. Turn on CMS.
13. Test and troubleshoot each switch connection using the procedures in *Avaya Call Management System Switch Connections, Administration, and Troubleshooting*.
14. Perform a CMSADM file system backup to back up the updated system configuration. See your CMS software installation, maintenance, and troubleshooting document for details.

## Adding a second HSI/P card

Use the following procedure to add a second HSI/P card to a system that is already in operation.

To add a second HSI/P card:

1. Verify that you have a recent CMSADM file system backup before you change card configurations.
2. Log in to the system as root.
3. Enter:

```
cfgadm
```

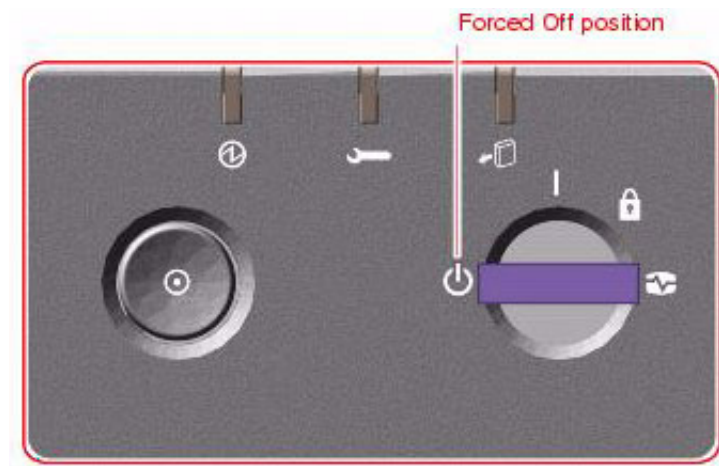
This displays the PCI card configuration before you add a card. Recheck the configuration after you have added the card.

4. Enter:

```
/usr/sbin/shutdown -y -i0 -g0
```

This shuts down the system.

5. Press and release the front panel power switch to turn off the system.  
Wait for the front panel Power/OK LED to turn off.
6. Turn the key switch to the Forced Off position. See the following figure.



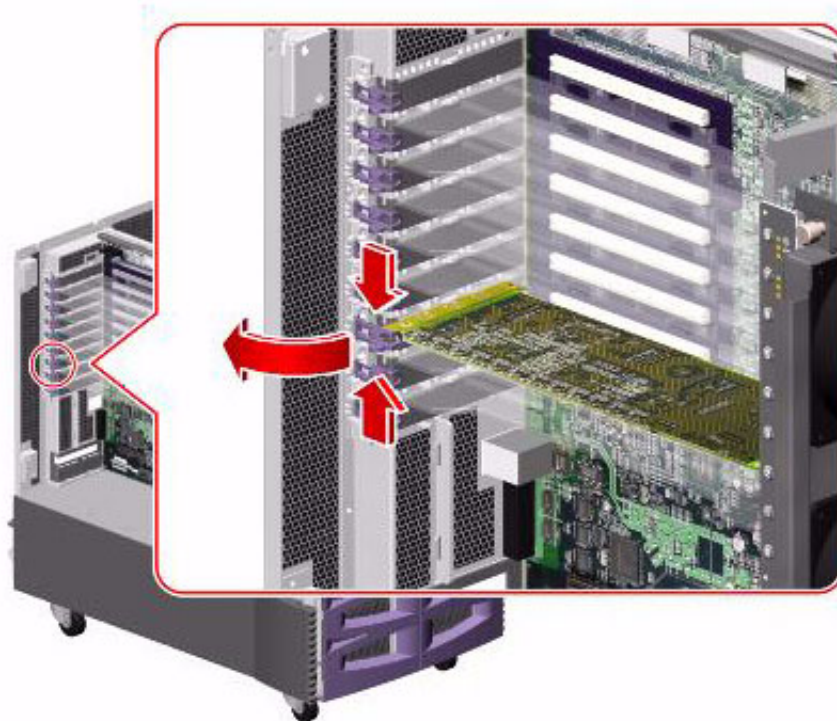
### **DANGER:**

Be sure to turn the key switch to the Forced Off position before handling any internal components. Otherwise, it is possible for a user to restart the system remotely while you are working inside it. The Forced Off position is the only key switch position that prevents an RSC user from restarting the system.

7. Turn off the system monitor.

## Maintenance

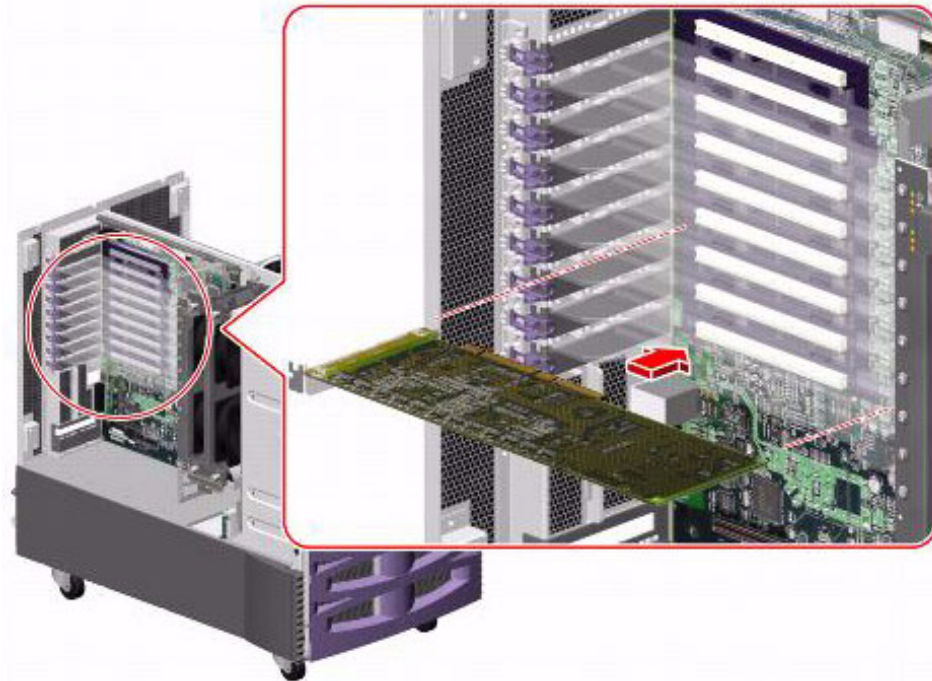
8. Turn off any external SCSI devices, starting with the device that is closest to the system and working toward the farthest device.
9. Open the left door.
10. Attach one end of an ESD antistatic wrist strap to the system chassis sheet metal and attach the other end to your wrist. See [Using an ESD wrist strap](#) on page 59 for more information.
11. Identify the slot in which you want to install the HSI/P card. Slot 4 is recommended for the second HSI/P card.
12. Pinch the purple PCI card retaining clip until it releases from the back of the card and rotate the clip outward. See the following figure.



13. If not already done, remove the filler panel from the slot.



14. Insert the HSI/P card into slot 4 on the I/O board. Make sure that the card is fully seated. See the following figure.



15. Rotate the purple PCI retaining clip over the back of the card faceplate until it snaps into place.
16. Remove the ESD wrist strap.
17. Close the left door.
18. Attach the HSI/P quad cable, and connect the switch links to the quad cable by following the instructions described in *Avaya Call Management System Switch Connections, Administration, and Troubleshooting*.
19. Turn on any external SCSI devices, starting with the device that is farthest from the system and working toward the system.
20. Turn on the system monitor.
21. Turn on the system.
22. When the system comes back up, log in as root.
23. Enter:  
  
`cfgadm`  
  
This displays the PCI card configuration after you add the card. Make sure that the new card is displayed.
24. Administer the switch links as shown in [Setting up the switch link for each ACD](#) on page 91.

---

## Maintaining disk drives

This section includes the following topics:

- [Prerequisites](#) on page 96
- [Disk drive compatibility with CMS loads](#) on page 96
- [Disk drive configurations](#) on page 96
- [Required references](#) on page 98
- [Replacing disk drives](#) on page 98
- [Adding disk drives \(optional\)](#) on page 116

---

### Prerequisites

If possible, do a CMSADM backup before you add or replace a disk drive. See your CMS software installation, maintenance, and troubleshooting document for this procedure.

Before you attempt to replace defective data (nonboot) disks, try to print the current setup for all ACDs. This information must be readministered after you install replacement disks.

---

### Disk drive compatibility with CMS loads

When a new or replacement disk drive is installed in an older system, the CMS load may not be compatible with the disk drive if the CMS configuration files have not been updated. Two configuration files (`/olds/disk.conf` and `/olds/olds-funcs`) must be edited or replaced with the correct information. Contact the Avaya technical support organization for assistance.

---

### Disk drive configurations

The computer supports a four-disk mirrored configuration. On only the V880, the configuration can be expanded to six disks with a field upgrade. The Sun Fire V880 supports 73-GB disks and the Sun Fire V890 supports 146-GB disks.

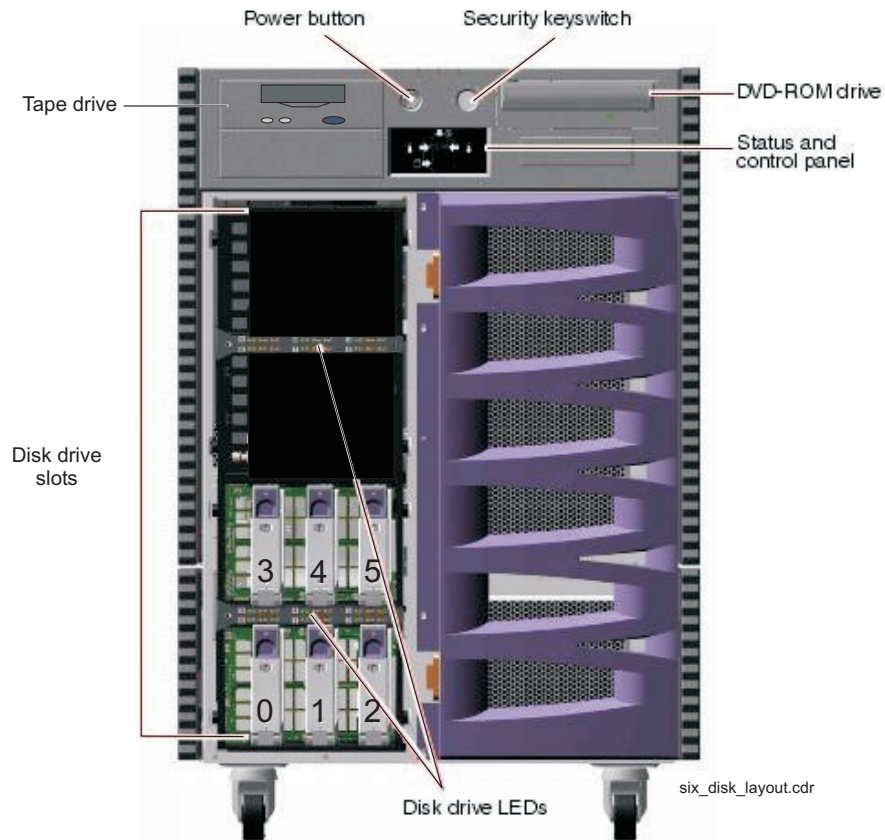


**Important:**

Disks cannot be swapped between the V880 and V890 models.



The following diagram shows a six-disk configuration on a V880:



The disks are mirrored as follows:

	Primary	Mirror
Boot disk pair	Slot 0	Slot 3
First data disk pair	Slot 1	Slot 4
Second data disk pair (optional on V880 only)	Slot 2	Slot 5



**Important:**

Each pair of disks must be the same size. For example, if the disk in slot 0 is 146-GB, the disk in slot 3 must also be 146-GB.

---

## Required references

You need access to the following documents to do the disk maintenance procedures:

- The CMS software installation, maintenance, and troubleshooting document for your CMS release
- *Sun Fire 880 Server Service Manual* or *Sun Fire V890 Server Service Manual* at the Sun documentation Web site:

<http://docs.sun.com>

---

## Replacing disk drives

The procedures for replacing disk drives is different for the following scenarios:

**Replacing a single boot disk:** If at least one of the boot disk drives (primary or mirror) is in operation, you can hot-plug a replacement boot disk drive without turning off the system. See [Replacing a single boot disk or replacing data disks](#) on page 99.

**Replacing data disk drives:** When replacing one or more data disk drives, you can hot-plug the replacement disk drives without turning off the system. See [Replacing a single boot disk or replacing data disks](#) on page 99.

**Replacing both boot disks:** If both boot disk drives are defective, you must shut down and turn off the system before replacing the disk drives. See [Replacing both boot disks](#) on page 105.

After replacing the disk drives, continue with [Setting up the disk drives](#) on page 109.

## Replacing a single boot disk or replacing data disks

If you are replacing a single boot disk or a data disk, you can hot-plug the disk drives without shutting down the system.

To remove and replace a single boot disk or a data disk:

1. Unlock and open the front door.
2. Identify which disk drives must be replaced.
3. Enter the following commands:

```
cd /
```

```
luxadm probe
```

The name of the fiber channel loop is displayed.

Found Enclosure: SUNWGS INT FCBPL    Name:FCloop    Node WWN:508002000016b5b0    Logical Path:/dev/es/ses0
---

4. Record the name of the fiber channel loop. In this example, the name is **FCloop**.
5. Enter:

```
luxadm display loop_name
```

where *loop\_name* is the name of the fiber channel loop.

Example:

```
luxadm display FCloop
```

The slot number for every disk in the system is displayed.

**Note:**

The system will display a warning if a problem is detected with any of the disk drives.

```

SUNWGS INT FCBPL
DISK STATUS
SLOT    DISKS                (Node WWN)
0       On (O.K.)            20000004cf81e68a
1       On (O.K.)            20000004cf81e851
2       Not Installed
3       On (O.K.)            20000004cf81e4d4
4       On (O.K.)            20000004cf81e910
5       Not Installed
6       On (Login failed)
7       On (Login failed)
8       On (Login failed)
9       On (Login failed)
10      On (Login failed)
11      On (Login failed)
SUBSYSTEM STATUS
FW Revision:9224    Box ID:0
Node WWN:508002000016b5b0    Enclosure Name:FCloop
SSC100's - 0=Base Bkpln, 1=Base LoopB, 2=Exp Bkpln, 3=Exp LoopB
SSC100 #0:    O.K.(9224/ 3FA5)
SSC100 #1:    O.K.(9224/ 3FA5)
SSC100 #2:    Not Installed
SSC100 #3:    Not Installed
Temperature Sensors - 0 Base, 1 Expansion
0:24°C
1Not Installed
Default Language is USA English, ASCII

```

6. Record the faulty disk number.

7. Enter:

```
luxadm remove loop_name,snumber
```

where *loop\_name* is the name of the fiber channel loop, and

where *number* is the slot number for the disk drive.

Example:

```
luxadm remove FCloop,s3
```

A message similar to the following is displayed:

```
WARNING!!! Please ensure that no filesystems are mounted on these device(s).
All data on these devices should have been backed up.

The list of devices which will be removed is:
1: Box Name:      "FCloop" slot 3
   Node WWN:      20000004cf81e4d4
   Device Type:   Disk device
   Device Paths:
   /dev/rdisk/clt3d0s2

Please verify the above list of devices and
then enter 'c' or <CR> to Continue or 'q' to Quit. [Default: c]:
```

**Note:**

If a "device is busy" message is displayed, verify that the correct device is being removed. Retry the command using the **-F** option. For example, enter **luxadm remove -F FCloop,s3**.

8. Verify that the disk you want to remove is displayed.

9. Choose one of the following:

- If the correct device is displayed, enter: **c**
- If the correct device is *not* displayed, enter: **q**

If you removed the device, a message similar to the following is displayed:

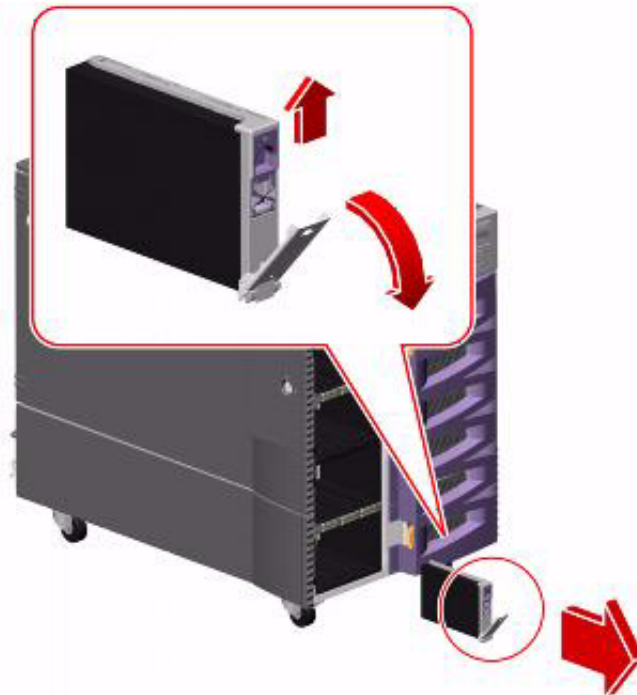
```
stopping: Drive in "FCloop" slot 3....Done
offlining: Drive in "FCloop" slot 3....Done

Hit <Return> after removing the device(s).
```

The amber LED for the disk turns on when the disk can be safely removed from the computer. The green LED for the disk starts blinking slowly.

10. Attach one end of an ESD antistatic wrist strap to the system chassis sheet metal and attach the other end to your wrist. See [Using an ESD wrist strap](#) on page 59 for more information.

11. Using your thumb and forefinger, push the drive latch upward to release the drive handle. Swing the handle away from the drive until you feel the drive connector disengage from the backplane. Do not use excessive force. See the following figure.



12. Holding the drive by the handle, carefully slide it out of the drive bay.
13. Place the drive on an antistatic mat or in an antistatic bag.
14. Press **Enter**.

A message similar to the following is displayed:

```
Drive in Box Name "FCloop" slot 3
Logical Nodes being removed under /dev/dsk/ and /dev/rdisk:
Logical Nodes being removed under /dev/dsk/ and /dev/rdisk:
  c1t3d0s0
  c1t3d0s1
  c1t3d0s2
  c1t3d0s3
  c1t3d0s4
  c1t3d0s5
  c1t3d0s6
  c1t3d0s7
```

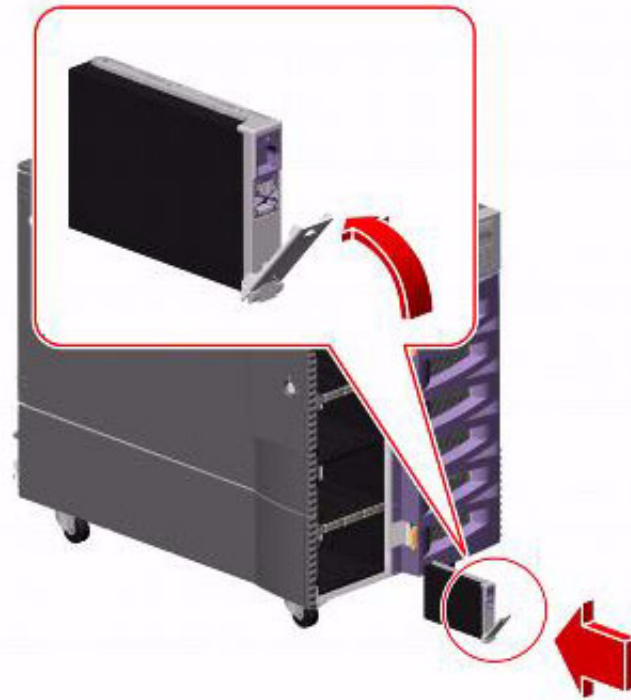
15. Enter:

**luxadm insert**

The following message is displayed:

Please hit <RETURN> when you have finished adding Fibre Channel Enclosure(s) /  
Device(s) :

16. Release the drive handle on the replacement disk drive. Use your thumb and forefinger to pinch the drive latch upward to open it.
17. Align the disk drive with its drive bay. Orient the drive so that the drive handle hinge faces the bottom of the drive bay.
18. Holding the drive by its handle, fit the drive into the guide rails at the top and bottom of the drive bay. See the following figure.



19. Slide the drive into the bay until it barely contacts the backplane.
20. Press carefully on the center of the drive. The drive handle begins to close as the drive engages its backplane connector.
21. Press the handle toward the drive until the latch closes, securing the drive in place.

### 22. Press **Enter**.

A message similar to the following is displayed:

```
Waiting for Loop Initialization to complete...
New Logical Nodes under /dev/dsk and /dev/rdisk :
    clt3d0s0
    clt3d0s1
    clt3d0s2
    clt3d0s3
    clt3d0s4
    clt3d0s5
    clt3d0s6
    clt3d0s7
No new enclosure(s) were added!!
```

**Note:**

Ignore the message **No new enclosure(s) were added!!**.

23. If you are installing more than one disk drive, wait for the green light on the drive you just installed to light steadily (not flashing) before installing another drive. Repeat Steps 3 through 22.
24. Close the front door and, if necessary, lock it.
25. Continue with [Setting up the disk drives](#) on page 109.



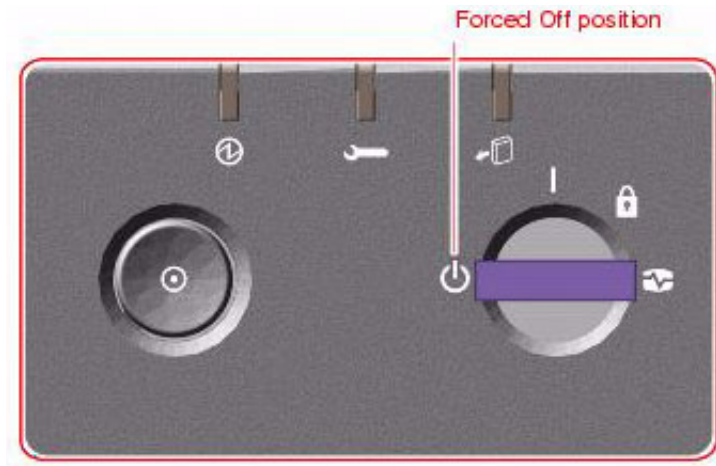
## Replacing both boot disks

To replace both boot disk drives:

1. If the system is operating, enter:  

```
/usr/sbin/shutdown -y -i0 -g0
```

  
The system shuts down and displays the **ok** prompt.
2. Press and release the front panel power button to turn off the system.  
Wait for the front panel Power/OK LED to turn off.
3. Turn the key switch to the Forced Off position. See the following figure.

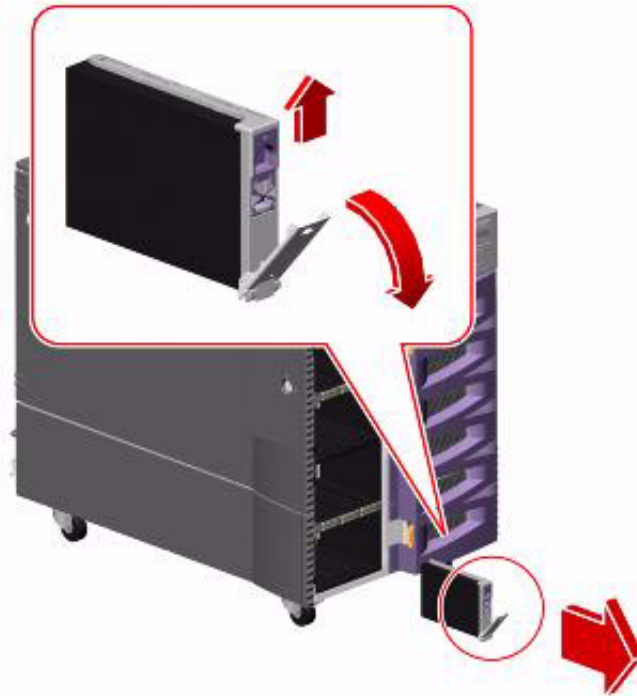


**⚠ DANGER:**

Be sure to turn the key switch to the Forced Off position before handling any internal components. Otherwise, it is possible for a user to restart the system remotely while you are working inside it. The Forced Off position is the only key switch position that prevents an RSC user from restarting the system.

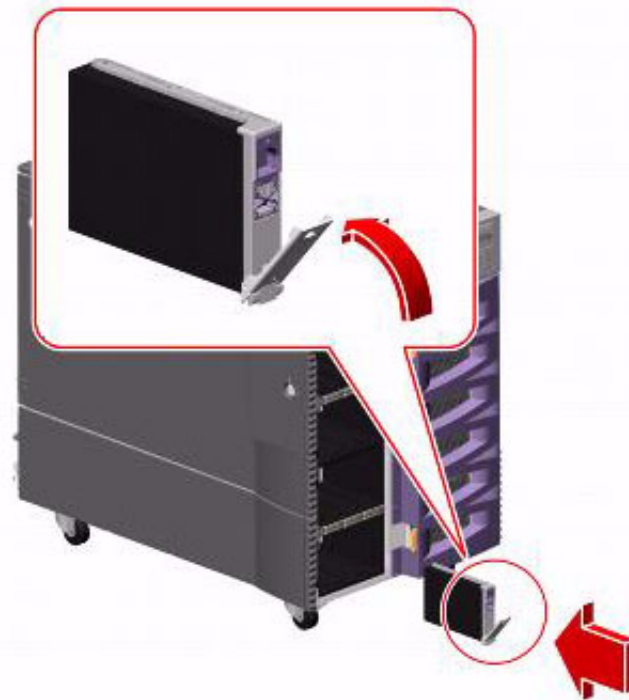
4. Turn off the system monitor.
5. If any external SCSI devices are installed, turn off the SCSI devices starting with the device that is closest to the system and work towards the farthest device.
6. Unlock and open the front door.
7. Attach one end of an ESD antistatic wrist strap to the system chassis sheet metal and attach the other end to your wrist. See [Using an ESD wrist strap](#) on page 59 for more information.

8. Using your thumb and forefinger, push the drive latch upward to release the drive handles for the disks in slots 0 and 3. Swing the handle away from the drive until you feel the drive connector disengage from the backplane. Do not use excessive force. See the following figure.



9. Holding the drive by the handle, carefully slide it out of the drive bay.
10. Place the drive on an antistatic mat or in an antistatic bag.
11. Release the drive handle on the replacement disk drive. Use your thumb and forefinger to pinch the drive latch upward to open it.
12. Align the disk drive with its drive bay. Orient the drive so that the drive handle hinge faces the bottom of the drive bay.

13. Holding the drive by its handle, fit the drive into the guide rails at the top and bottom of the drive bay. See the following figure.



14. Slide the drive into the bay until it barely contacts the backplane.
15. Press carefully on the center of the drive. The drive handle begins to close as the drive engages its backplane connector.
16. Press the handle toward the drive until the latch closes, securing the drive in place.
17. Repeat this procedure for both boot disk drives.
18. Close the front door and, if necessary, lock it.
19. Turn on any external SCSI devices, starting with the device that is farthest from the system and working toward the system.
20. Turn on the system monitor.
21. Turn on the system. Do *not* put the key switch in the locked position.  
As the system powers up, the power LED on the monitor flashes.
22. Press **Stop+A** simultaneously as soon as the monitor power LED lights steadily and the Sun logo is displayed on the monitor.  
The **ok** prompt is displayed.

23. Enter the following commands:

```
setenv auto-boot? false
reset-all
```

The system reboots to the **ok** prompt.

24. Enter:

```
probe-scsi
```

This verifies that the system recognizes all of the disk devices, including the newly installed ones. A message that is similar to the following example is displayed:

LiD	HA	LUN	---	Port	WWN	---	-----Disk description	-----
0	0	0		21000004cf72f08f			SEAGATE ST373405FSUN3660438	
1	1	0		21000004cf721553			SEAGATE ST373405FSUN3660438	
6	6	0		508002000016b5b1			SUNW SUNWGS INT FCBPL9224	
3	3	0		21000004cf72114b			SEAGATE ST373405FSUN3660438	
4	4	0		21000004cf7211ae			SEAGATE ST373405FSUN3660438	

The devices listed depends on the number of disks that are installed in the system.

25. Enter the following commands:



**CAUTION:**

If you fail to enter these commands, any reboots that you do in the future will stop at the boot prompt instead of proceeding through the normal boot-up process.

```
setenv auto-boot? true
```

```
boot -r
```

The system reboots.

26. Log in as root.
27. Continue with [Setting up the disk drives](#) on page 109.

## Setting up the disk drives

After you replace defective disk drives, do one of the following, depending on drives replaced:

Drives replaced	Procedure
One boot disk	Partition the new boot disk drive (see <a href="#">Partitioning disk drives</a> on page 109). Continue with the procedures in "Recovering a mirrored system after disk failure" in the maintenance chapter of the CMS software installation, maintenance, and troubleshooting document for your CMS release.
Both boot disks	Continue with the procedures in "Performing a CMSADM restore of a mirrored or non-mirrored system" in the maintenance chapter of the CMS software installation, maintenance, and troubleshooting document for your CMS release.
Data disks	Partition and administer the drive so that it works with the existing disk drives (see <a href="#">Partitioning disk drives</a> on page 109). Continue with the procedures in "Recovering a mirrored system after disk failure" in the maintenance chapter of the CMS software installation, maintenance, and troubleshooting document for your CMS release.

## Partitioning disk drives

If you are replacing a defective data disk drive in a system and CMS is not operational, or if you are replacing a single defective boot disk (primary or mirror), you must manually partition the disk drive. Use the following information:

- [Disk partition values](#), [Boot disks](#) on page 110 or [Data disks](#) on page 111.
- [Partitioning and formatting a disk](#) on page 112.

## Disk partition values

During the disk partitioning procedure, you must enter the size of each partition. Since disk models change often, see the software installation, maintenance, and troubleshooting document for your current CMS release to verify the correct disk partitioning values.

**Boot disks:** The following table lists the boot disk drives. These partition sizes are entered in Gigabytes (gb).

Disk	Partition	ID tag	Permission flag	Starting cylinder	Value
<b>146-GB (V890)</b>	0	root	wm	0	4gb
	1	swap	wu	413	1gb
	2 <sup>1</sup>	backup	wm	Use the default values for partition 2.	
	3	un	wm	517	3gb
	4	un	wm	827	2gb
	5-7	un	wm	Do not enter a value for partitions 5 through 7. These values are populated automatically when the boot disks resynchronize during the restore procedure.	
<b>73-GB<sup>2</sup> (V880)</b>	0	root	wm	0	4gb
	1	swap	wu	825	1gb
	2 <sup>1</sup>	backup	wm	Use the default values for partition 2.	
	3	un	wm	1032	3gb
	4	un	wm	1651	2gb
	5-7	un	wm	Do not enter a value for partitions 5 through 7. These values are populated automatically when the boot disks resynchronize during the restore procedure.	

1. The value that is displayed for the backup partition shows the size of the disk drive. If the disk drive you are partitioning does not closely match the size of the disk you are partitioning (for example, 68-GB for a 73-GB disk), you have a nonstandard disk. Escalate the issue to Avaya technical support.

2. Sun identifies these disk drives as 73-GB, but the format command shows them as 72-GB.

**Data disks:** The following table lists the data disk drives. These partition sizes are entered in Gigabytes (gb) and cylinders (c).

Disk	Partition	ID tag	Permission flag	Starting cylinder	Value
<b>146-GB (V890)</b>	0	un	wm	0	2gb
	1	un	wm	207	2gb
	2 <sup>1</sup>	backup	Do not enter a value for partition 2.		
	3	un	wm	414	2gb
	4	un	wm	621	2gb
	5	un	wm	828	2gb
	6	un	wm	1035	2gb
	7	un	wm	1242	12845c
<b>73-GB<sup>2</sup> (V880)</b>	0	un	wm	0	2gb
	1	un	wm	413	2gb
	2 <sup>1</sup>	backup	Do not enter a value for partition 2.		
	3	un	wm	826	2gb
	4	un	wm	1239	2gb
	5	un	wm	1652	2gb
	6	un	wm	2065	2gb
	7	un	wm	2478	11609c

1. The value that is displayed for the backup partition shows the size of the disk drive. If the disk drive you are partitioning does not closely match the size of the disk you are partitioning (for example, 68-GB for a 73-GB disk), you have a nonstandard disk. Escalate the issue to Avaya technical support.

2. Sun identifies these disk drives as 73-GB, but the format command shows them as 72-GB.

## Partitioning and formatting a disk

To partition and format a disk:

1. At the system prompt, enter:

**format**

A message that is similar to the following example is displayed:

```
Searching for disks...done

AVAILABLE DISK SELECTIONS:
  0. clt0d0 <SUN146G cyl 14087 alt 2 hd 24 sec 848>
    /pci@8,600000/SUNW,qlc@2/fp@0,0/ssd@w500000e010ad48e1,0
  1. clt1d0 <SUN146G cyl 14087 alt 2 hd 24 sec 848>
    /pci@8,600000/SUNW,qlc@2/fp@0,0/ssd@w500000e010ad39f1,0
  2. clt3d0 <SUN146G cyl 14087 alt 2 hd 24 sec 848>
    /pci@8,600000/SUNW,qlc@2/fp@0,0/ssd@w21000011c6469a7e,0
  3. clt4d0 <SUN146G cyl 14087 alt 2 hd 24 sec 848>
    /pci@8,600000/SUNW,qlc@2/fp@0,0/ssd@w21000011c659c9d0,0
Specify disk (enter its number):
```

2. Enter the disk number that corresponds to the disk that you added. Be sure to specify the number that *exactly* matches the disk added.

```
Specify disk (enter its number): 1
```

The device number of the disk that you are partitioning, for example, **c0t1d0**, and the Format Menu are displayed:

```
selecting clt1d0
[disk formatted]

FORMAT MENU:
  disk      - select a disk
  type      - select (define) a disk type
  partition - select (define) a partition table
  current   - describe the current disk
  format    - format and analyze the disk
  repair    - repair a defective sector
  label     - write label to the disk
  analyze   - surface analysis
  defect    - defect list management
  backup    - search for backup labels
  verify    - read and display labels
  save      - save new disk/partition definitions
  inquiry   - show vendor, product and revision
  volname   - set 8-character volume name
  !<cmd>    - execute <cmd>, then return
  quit

format>
```



3. Enter:

**partition**

The partition menu is displayed:

```

PARTITION MENU:
    0      - change `0' partition
    1      - change `1' partition
    2      - change `2' partition
    3      - change `3' partition
    4      - change `4' partition
    5      - change `5' partition
    6      - change `6' partition
    7      - change `7' partition
select - select a predefined table
modify - modify a predefined partition table
name    - name the current table
print   - display the current table
label   - write partition map and label to the disk
!<cmd> - execute <cmd>, then return
quit
partition>

```

4. At the **partition>** prompt, enter:

**print**

The default partition table is displayed. The table for a 146-GB FC-AL data disk will look similar to the following example:

```

Current partition table (original):
Total disk cylinders available: 14087 + 2 (reserved cylinders)

Part      Tag      Flag      Cylinders      Size      Blocks
  0       root      wm        0 - 412        4.01GB    (413/0/0)    8405376
  1       swap      wu       413 - 516        1.01GB    (104/0/0)    2116608
  2    backup      wm        0 - 14086     136.71GB   (14087/0/0) 286698624
  3 unassigned      wm       517 - 826        3.01GB    (310/0/0)    6309120
  4 unassigned      wm       827 - 1033       2.01GB    (207/0/0)    4212864
  5 unassigned      wm      1034 - 1240       2.01GB    (207/0/0)    4212864
  6 unassigned      wm      1241 - 1447       2.01GB    (207/0/0)    4212864
  7 unassigned      wm     1448 - 14086   122.66GB   (12639/0/0) 257228928

partition>

```

5. Partition the disk by completing the following Steps a through e for all partitions specified in the [Disk partition values](#) on page 110.

a. At the **partition>** prompt, enter the partition number from the table. For example:

```
partition> 0
```

The system prompts for the partition ID tag.

- b. Enter the partition ID tag from the table. For partition 0, press **Enter** to accept the default of unassigned.

```
Enter partition id tag [unassigned]:
```

The system prompts for permission flags.

- c. Enter the permission flag, usually **wm** or **wu**.

The system prompts for the starting cylinder.

- d. Enter the number of the starting cylinder from the table. For example:

```
Enter new starting cyl [0]: 0
```

The system prompts for the partition size.

- e. Enter the partition size from the table. For example:

```
Enter partition size [0b, 0c, 0mb]: 2gb
```

The **partition>** prompt is displayed.

6. When you have sized all of the partitions, enter:

**print**

7. Compare the partition table that is now displayed to the [Disk partition values](#) on page 110. If there are any discrepancies, correct them by repeating the disk partitioning.

8. When you determine that the disk partitioning is correct, enter:

**label**

The system prompts you to continue.



**Important:**

Do not forget to label the disk drive.

9. Enter: **y**

The **partition>** prompt is displayed.

10. Enter: **q**

The **format>** prompt is displayed.

11. Enter:

**format**

The following message is displayed:

```
Ready to format. Formatting cannot be interrupted  
and takes XX minutes (estimated). Continue? (y or n)
```

12. Enter: **y**

A message similar to the following is displayed:

```
Begin format. The current time is <timestamp>

Formatting...
done

Verifying media...
    pass 0 - pattern = 0xc6dec6de
    4923/26/7

    pass 1 - pattern = 0x6db6db6d
    4923/26/7

Total of 0 defective blocks repaired.
format>
```

13. If you added more than one disk drive, enter **disk**, and repeat Steps 2 through 12 for each drive.
14. After you have partitioned each drive, enter: **q**
15. Continue with the restore procedures as described in [Setting up the disk drives](#) on page 109.

---

## Adding disk drives (optional)

If you are adding a pair of data disks (optional), you can hot-plug the disk drives without shutting down the system.

To add a pair of data disks:

1. Unlock and open the front door.
2. Enter the following commands:

```
cd /
```

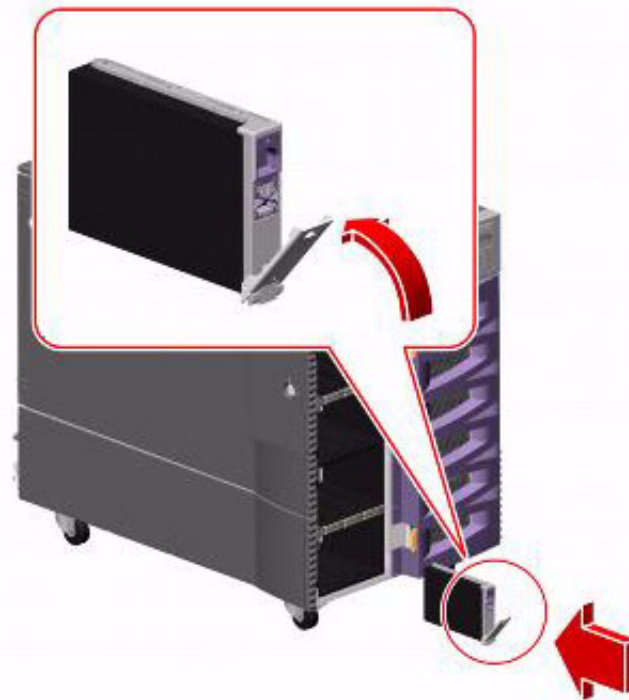
```
luxadm insert
```

The following message is displayed:

```
Please hit <RETURN> when you have finished adding Fibre Channel Enclosure(s) /  
Device(s) :
```

3. Attach one end of an ESD antistatic wrist strap to the system chassis sheet metal and attach the other end to your wrist. See [Using an ESD wrist strap](#) on page 59 for more information.
4. Release the drive handle on the replacement disk drive. Use your thumb and forefinger to pinch the drive latch upward to open it.
5. Align the disk drive with slot 2. Orient the drive so that the drive handle hinge faces the bottom of the drive bay.

6. Holding the drive by its handle, fit the drive into the guide rails at the top and bottom of the drive bay. See the following figure.



7. Slide the drive into the bay until it barely contacts the backplane.
8. Press carefully on the center of the drive. The drive handle begins to close as the drive engages its backplane connector.
9. Press the handle toward the drive until the latch closes, securing the drive in place.
10. Press **Enter**.

A message similar to the following is displayed:

```
Waiting for Loop Initialization to complete...
New Logical Nodes under /dev/dsk and /dev/rdisk :
  clt2d0s0
  clt2d0s1
  clt2d0s2
  clt2d0s3
  clt2d0s4
  clt2d0s5
  clt2d0s6
  clt2d0s7
No new enclosure(s) were added!!
```

**Note:**

Ignore the message **No new enclosure(s) were added!!**.

11. Wait for the green light on the drive you just installed to light steadily (not flashing) before installing another drive.
12. Repeat Steps 2 through 11 for the data disk installed in slot 5.
13. Close the front door and, if necessary, lock it.
14. Enter:

**cmssvc**

The CMS Services menu is displayed.

**Note:**

If the system also displays the following message, you must first turn on IDS before continuing with Step 15.

```
cmssvc: Warning IDS off-line. It will take approx 30 seconds to start cmssvc. IDS can  
be turned on with the run_ids command on the cmssvc menu.
```

15. Enter the number that corresponds to the **disk\_space** option.
16. Enter the number that corresponds to the **Add new disks** option.  
The disks to be added are displayed.
17. Enter the number that corresponds to the disks you want to add.

The system administers the new disks, which may take several minutes depending on the number and size of the disks. The following message is displayed:

```
added new disk cXtXd0  
disk_space command completed.
```

**Note:**

Depending on the size of the disks, the system may run slowly until all disks are synchronized.

---

## Replacing the DVD drive

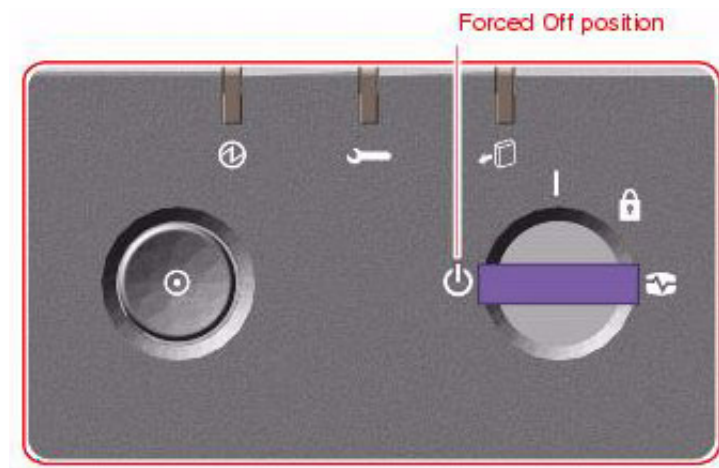
To replace the DVD drive:

1. Remove any disks from the drive.
2. Log in to the system as root.
3. Enter:

```
/usr/sbin/shutdown -y -i0 -g0
```

This shuts down the system. The `ok` prompt is displayed at the local console.

4. Press and release the front panel power button to turn off the system.  
Wait for the front panel Power/OK LED to turn off.
5. Turn the key switch to the Forced Off position. See the following figure.



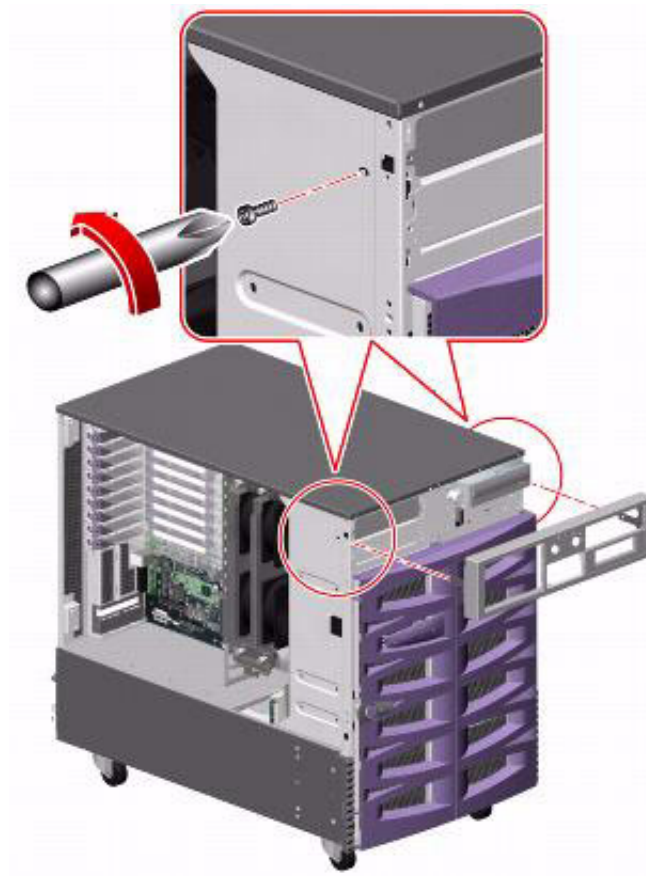
**⚠ DANGER:**

Be sure to turn the key switch to the Forced Off position before handling any internal components. Otherwise, it is possible for a user to restart the system remotely while you are working inside it. The Forced Off position is the only key switch position that prevents an RSC user from restarting the system.

6. Open both side doors of the computer. See [Accessing components inside the computer](#) on page 56 for more information
7. Attach one end of an ESD antistatic wrist strap to the system chassis sheet metal and attach the other end to your wrist. See [Using an ESD wrist strap](#) on page 59 for more information.

## Maintenance

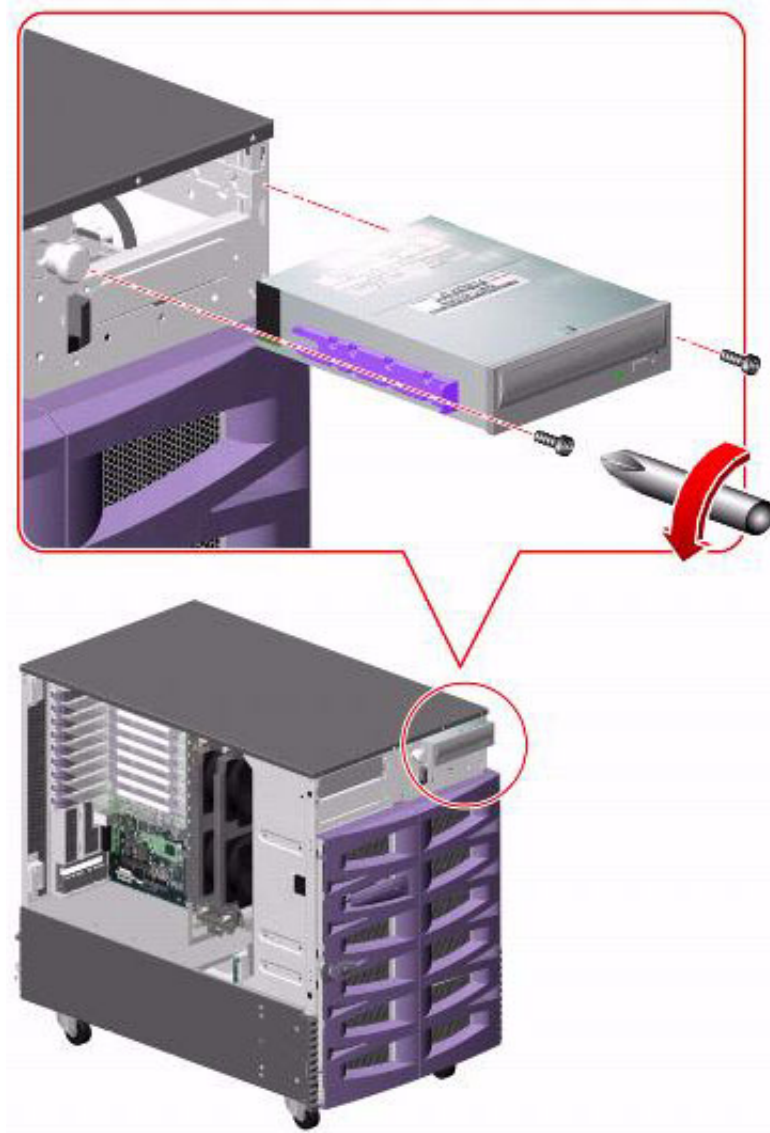
8. Remove the two screws securing the front cover to the front of the system. See the following figure.



9. Remove the front cover.
10. Disconnect the data and power cables from the back of the drive.



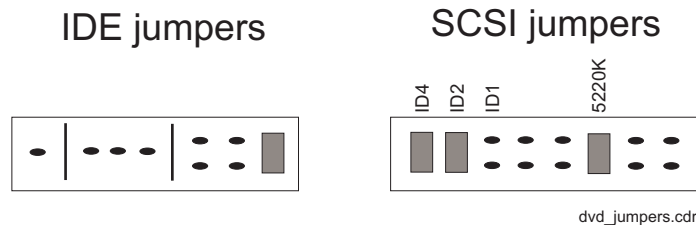
11. Remove the two screws that secure the drive to the chassis. See the following figure.



12. Slide the drive out through the front of the chassis.

13. Do one of the following:

- On the IDE model DVD in the V890, set the IDE interface to the Primary Master position. This setting is done using the jumpers on the back of the drive as shown in the following diagram.
- On the SCSI model DVD in the V880, set the SCSI address to 6. The address is set by placing jumpers on locations ID4 and ID2 as shown in the following diagram. The 5220K jumper should already be in place.



14. Slide the replacement drive into the chassis and secure it with the screws that were removed earlier.

15. Connect the drive data and power cables to the back of the drive.

16. Replace the front cover.

17. Remove the ESD wrist strap.

18. Close the side doors.

19. Turn on the system. Do *not* put the key switch in the locked position.

As the system powers up, the power LED on the monitor flashes.

20. Press **Stop+A** simultaneously as soon as the monitor power LED lights steadily and the Sun logo is displayed on the monitor.

The **ok** prompt is displayed.

21. Enter the following commands:

```
setenv auto-boot? false
reset-all
```

This resets the system and the **ok** prompt is displayed.

22. Do one of the following:

- For the V880, enter:  
**probe-scsi-all**
- For the V890, enter:  
**probe-ide**

This checks to see that the system recognizes the new drive. If the new drive is not listed, make sure there is a secure cable connection.

23. Reboot the system by entering the following commands:

**CAUTION:**

If you fail to enter these commands, any reboots that you do in the future will stop at the boot prompt instead of proceeding through the normal boot-up process.

```
setenv auto-boot? true
```

```
boot
```

This reboots the system.

---

## Maintaining tape drives

This section includes the following topics:

- [Tape drive compatibility](#) on page 124
- [Ordering tapes](#) on page 124
- [Cleaning the tape drive](#) on page 125
- [Replacing the internal tape drive](#) on page 126
- [Adding and removing an external tape drive for data migration](#) on page 129

---

### Tape drive compatibility

The DDS-4 tape drive used with the V880 is *not* the same model used with the Sun Enterprise 3500. When replacing a DDS-4 tape drive in the V880, make sure you order the correct replacement.

---

### Ordering tapes

Replacement backup data and tape drive cleaning cartridge tapes can be ordered from your local computer or office supply store. You cannot order tapes from Avaya. Depending on your tape drive model, order the following cartridge tapes:

Description	Tape drive
DAT 72 36/72-GB, 4mm, 170m	DAT 72
DDS-4 20/40-GB, 4mm, 150-155m	DDS-4 and DAT 72
DDS 4mm cleaning cartridge	DDS-4 and DAT 72

**Important:**

If you are using the CMS High Availability feature and one of your systems uses a DDS-4 tape drive while the other uses a DAT 72 tape drive, you must use DDS-4 tape cartridges in both systems. Using the same size backup tapes allows you to do manual data restores on both systems, no matter which one may need the restore.

---

## Cleaning the tape drive

This section describes how you clean the tape drive.

**Note:**

CMS computers do not ship with tape drive cleaning tapes. Avaya recommends that customers purchase at least one cleaning tape as soon as the computer is installed and in service.

The number of cleaning cycles available on a cleaning cartridge depends on the manufacturer of the cartridge. Regular cleaning is recommended to maximize tape drive performance. Avaya recommends that you clean the tape drive once a week or every five (5) data backups, whichever comes first.

The LEDs on the tape drives indicate when the tape drives need cleaning. See [Tape drive status indicators](#) on page 184. If the Clean LED flashes, either the tape drive heads need cleaning, or the backup tape needs replacing.

To clean the tape drive:

1. Load the cleaning cartridge into the tape drive.

The cleaning cycle begins automatically, and the Tape LED flashes. When the cleaning cycle is complete, the cleaning cartridge is ejected automatically. If the cleaning cartridge does not eject automatically, it may be defective and may need replacing.

2. The first time you use the cleaning cartridge, record the date on the cleaning cartridge. Each time you clean the tape drive, mark an X in the box. After all boxes are filled, replace the cleaning cartridge.
3. Return the cleaning cartridge to the plastic protection box.

If the Clean LED continues to flash, repeat the cleaning procedure using a different cleaning cartridge. If the Clean LED is still flashing, repeat the backup operation with a different tape. If this clears the signal, the first backup tape is nearing the end of its life. Discard the old tape.

## Replacing the internal tape drive

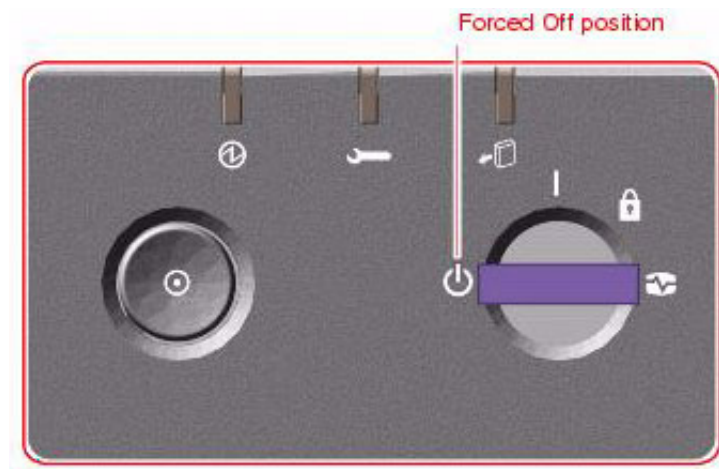
To replace the internal tape drive:

1. Remove any tapes from the drive.
2. Log in to the system as root.
3. Enter:

```
/usr/sbin/shutdown -y -i0 -g0
```

This shuts down the system. The `ok` prompt is displayed at the local console.

4. Press and release the front panel power button to turn off the system.  
Wait for the front panel Power/OK LED to turn off.
5. Turn the key switch to the Forced Off position. See the following figure.

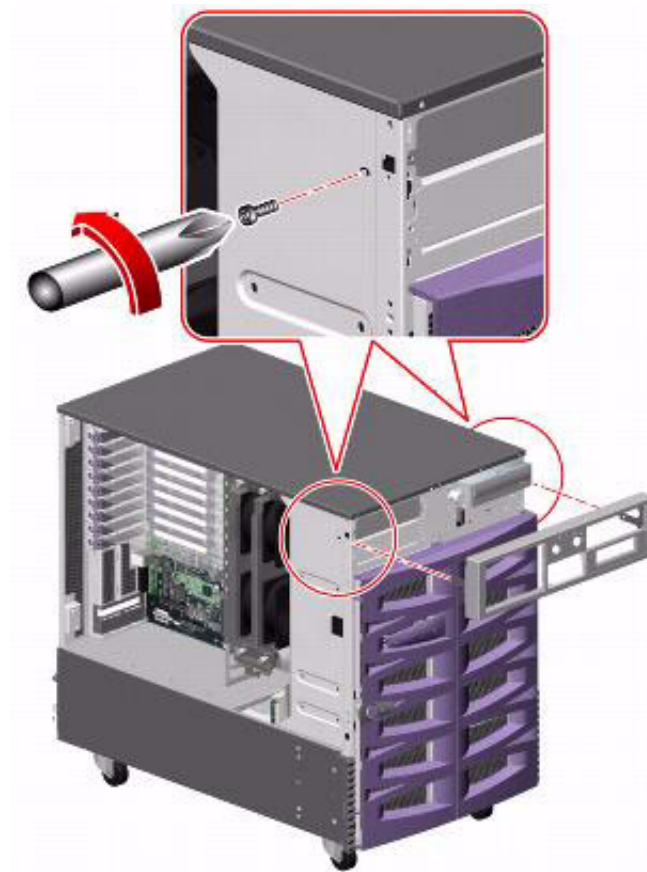


**⚠ DANGER:**

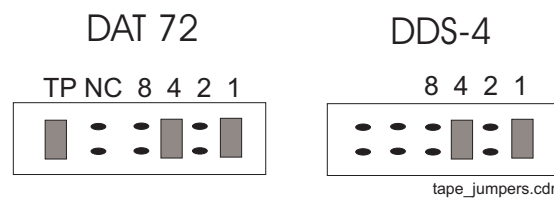
Be sure to turn the key switch to the Forced Off position before handling any internal components. Otherwise, it is possible for a user to restart the system remotely while you are working inside it. The Forced Off position is the only key switch position that prevents an RSC user from restarting the system.

6. Open both side doors of the computer. See [Accessing components inside the computer](#) on page 56 for more information
7. Attach one end of an ESD antistatic wrist strap to the system chassis sheet metal and attach the other end to your wrist. See [Using an ESD wrist strap](#) on page 59 for more information.

8. Remove the two screws securing the front cover to the front of the system. See the following figure.



9. Remove the front cover.
10. Disconnect the data and power cables from the back of the drive.
11. Remove the two screws that secure the drive to the chassis.
12. Slide the drive out through the front of the chassis.
13. Set the SCSI address on the new drive using the jumpers on the back of the drive. Set the tape drive to 5. See the following figure.



14. Slide the replacement drive into the chassis and secure it with the screws that you removed earlier.

15. Connect the drive data and power cables to the back of the drive.
16. Replace the front cover.
17. Remove the ESD wrist strap.
18. Close the side doors.
19. Turn on the system. Do *not* put the key switch in the locked position.

As the system powers up, the power LED on the monitor flashes.

20. Press **Stop+A** simultaneously as soon as the monitor power LED lights steadily and the Sun logo is displayed on the monitor.

The **ok** prompt is displayed.

21. Enter the following commands:

```
setenv auto-boot? false
```

```
reset-all
```

This resets the system and the **ok** prompt is displayed.

22. Enter:

```
probe-scsi-all
```

This checks to see that the system recognizes the new drive. If the new drive is not listed, make sure there is a secure cable connection.

23. Reboot the system by entering the following commands:



### **CAUTION:**

If you fail to enter these commands, any reboots that you do in the future will stop at the boot prompt instead of proceeding through the normal boot-up process.

```
setenv auto-boot? true
```

```
boot
```

This reboots the system.



## Adding and removing an external tape drive for data migration

To temporarily add an external tape drive for data migration, and remove the tape drive when the migration is complete:

1. Log in to the system as root.
2. Enter the following commands:

```
cd /dev/rmt
```

```
pwd
```

The `pwd` command verifies that you are in the `/dev/rmt` directory.

3. Enter:

```
rm *
```

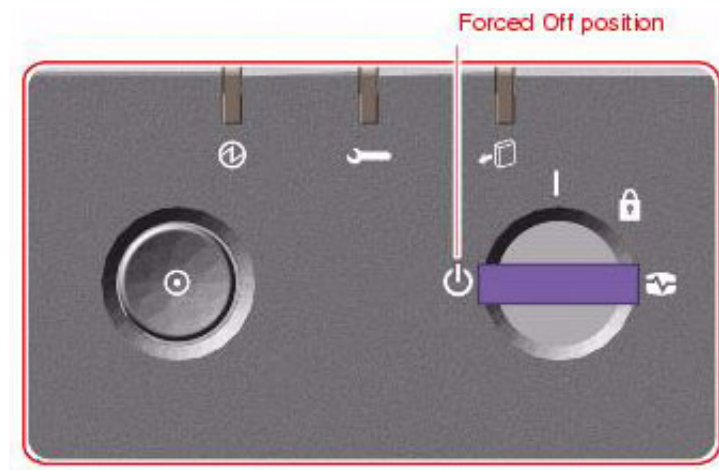
This removes tape drive device files. If you do not remove the tape drive device files before rebooting the system, the tape drive device files may not match the hardware configuration.

4. Enter:

```
/usr/sbin/shutdown -y -i0 -g0
```

The system shuts down.

5. Press and release the front panel power button to turn off the system.  
Wait for the front panel Power/OK LED to turn off.
6. Turn the key switch to the Forced Off position. See the following figure.





### **DANGER:**

Be sure to turn the key switch to the Forced Off position before handling any internal components. Otherwise, it is possible for a user to restart the system remotely while you are working inside it. The Forced Off position is the only key switch position that prevents an RSC user from restarting the system.

7. Turn off the system monitor.
8. Turn off any external SCSI devices, starting with the device that is closest to the system and working toward the farthest device.
9. Using the Target Address Switch on the back of the external tape drive, set the SCSI ID to 4.
10. Connect the tape drive to either the single SCSI port on the single SCSI card or the Channel B SCSI port on the dual SCSI card.
11. Connect the power cord from the tape drive to a power source.
12. Turn on any external SCSI devices, starting with the device that is farthest from the system and working toward the system.
13. Turn on the system monitor.
14. Turn on the system. Do *not* put the key switch in the locked position.  
As the system powers up, the power LED on the monitor flashes.
15. Press **Stop+A** simultaneously as soon as the monitor power LED lights steadily and the Sun logo is displayed on the monitor.  
The **ok** prompt is displayed.
16. Enter the following commands:  

```
setenv auto-boot? false
```

```
reset-all
```

The system resets and displays the **ok** prompt.
17. Enter:  

```
probe-scsi-all
```

This checks to see that the system recognizes the new tape drive. The resulting display should list the new drive as Target 4. If the new drive is not listed, check for a secure connection between the SCSI port and the new drive.

18. Reboot the system by entering the following commands:

**CAUTION:**

If you fail to enter these commands, any reboots that you do in the future will stop at the boot prompt instead of proceeding through the normal boot-up process.

```
setenv auto-boot? true
```

```
boot -r
```

This reboots the system so that it recognizes the new configuration.

19. Use the external tape drive to migrate data onto the system.
20. When finished migrating the data, enter the following commands:

```
cd /dev/rmt
```

```
pwd
```

The `pwd` command verifies that you are in the `/dev/rmt` directory.

21. Remove any tapes from the drive.
22. Enter:

```
rm *
```

This removes tape drive device files. If you do not remove the tape drive device files before rebooting the system, the tape drive device files may not match the hardware configuration.

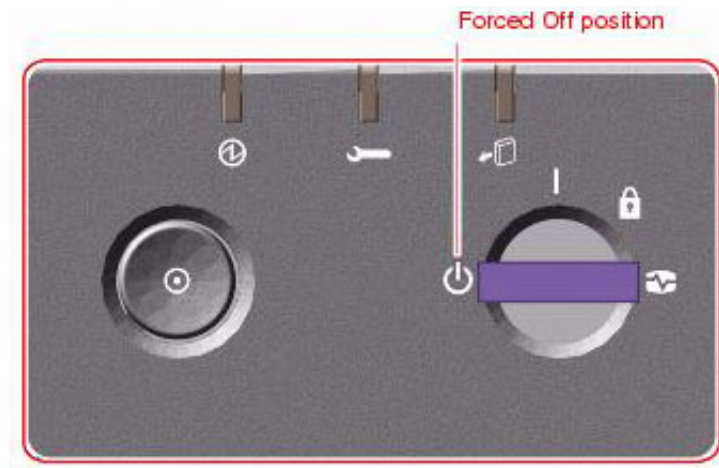
23. Enter:

```
/usr/sbin/shutdown -y -i0 -g0
```

The system shuts down.

24. Press and release the front panel power button to turn off the system.  
Wait for the front panel Power/OK LED to turn off.

25. Turn the key switch to the Forced Off position. See the following figure.



**⚠ DANGER:**

Be sure to turn the key switch to the Forced Off position before handling any internal components. Otherwise, it is possible for a user to restart the system remotely while you are working inside it. The Forced Off position is the only key switch position that prevents an RSC user from restarting the system.

26. Turn off the system monitor.
27. Turn off any external SCSI devices, starting with the device that is closest to the system and working toward the farthest device.
28. Disconnect the tape drive from the SCSI port.
29. Turn on any external SCSI devices, starting with the device that is farthest from the system and working toward the system.
30. Turn on the system monitor.
31. Turn on the system. Do *not* put the key switch in the locked position.  
As the system powers up, the power LED on the monitor flashes.
32. Press **Stop+A** simultaneously as soon as the monitor power LED lights steadily and the Sun logo is displayed on the monitor.  
The **ok** prompt is displayed.
33. Enter the following commands:  

```
setenv auto-boot? false
reset-all
```

  
The system resets.

34. Enter:

```
probe-scsi-all
```

In its default configuration, the computer should list two SCSI devices: the internal tape drive (Target 5) and the DVD drive (Target 6).

35. Reboot the system by entering the following commands:

**CAUTION:**

If you fail to enter these commands, any reboots that you do in the future will stop at the boot prompt instead of proceeding through the normal boot-up process.

```
setenv auto-boot? true
```

```
boot -r
```

This reboots the system so that it recognizes the new configuration.

---

## Maintaining CPU/Memory boards

This section describes how to replace or add memory modules and CPU/Memory boards.

This section includes the following topics:

- [CPU and memory configurations](#) on page 134
- [Checking the current memory and CPU configuration](#) on page 135
- [Shutting down the system](#) on page 136
- [Removing a CPU/Memory board](#) on page 137
- [Replacing memory](#) on page 138
- [Installing a CPU/Memory board](#) on page 140
- [Restarting the system](#) on page 143



**WARNING:**

You must wear an ESD wrist strap when installing or removing hardware components to prevent electrical discharge that can damage the system.

---

## CPU and memory configurations

The minimum memory configuration of the V880 is one CPU/Memory board that has two processors and 4-GB of memory. The V880 computer can be upgraded to a total of four CPU/Memory boards, with a maximum memory of 16-GB.

The minimum memory configuration of the V890 is one CPU/Memory board that has two processors and 8-GB of memory. The V890 computer can be upgraded to a total of two CPU/Memory boards, with a maximum memory of 16-GB.



**Important:**

The CPUs in all memory boards must match. You cannot, for example, mix a 900 MHz CPU with a 1.2 GHz CPU, or an UltraSPARC III CPU with an UltraSPARC IV CPU.

## Checking the current memory and CPU configuration

To check the current memory size, memory configuration, and CPU configuration:

1. Enter:

```
/usr/platform/`uname -m`/sbin/prtdiag -v | pg
```

The current memory size, memory configuration, and CPU configuration are displayed in a message similar to the following:

```
System Configuration: Sun Microsystems sun4u Sun Fire V890
System clock frequency: 150 MHz
Memory size: 8192 Megabytes

===== CPUs =====

Brd  CPU   Run   E$   CPU   CPU
      CPU   MHz   MB   Impl.  Mask
-----
A  0, 16 1350 16.0 US-IV  3.1
A  2, 18 1350 16.0 US-IV  3.1

===== Memory Configuration =====

      MC   Logical  Logical  Logical
Brd  ID   Bank   Bank   Bank   DIMM   Interleave  Interleaved
-----
A    0    0    1024MB no_status 512MB   8-way      0
A    0    1    1024MB no_status 512MB   8-way      0
A    0    2    1024MB no_status 512MB   8-way      0
A    0    3    1024MB no_status 512MB   8-way      0
A    2    0    1024MB no_status 512MB   8-way      0
A    2    1    1024MB no_status 512MB   8-way      0
A    2    2    1024MB no_status 512MB   8-way      0
A    2    3    1024MB no_status 512MB   8-way      0
.
.
```

2. Record the current memory size, memory configuration, and CPU configuration.

---

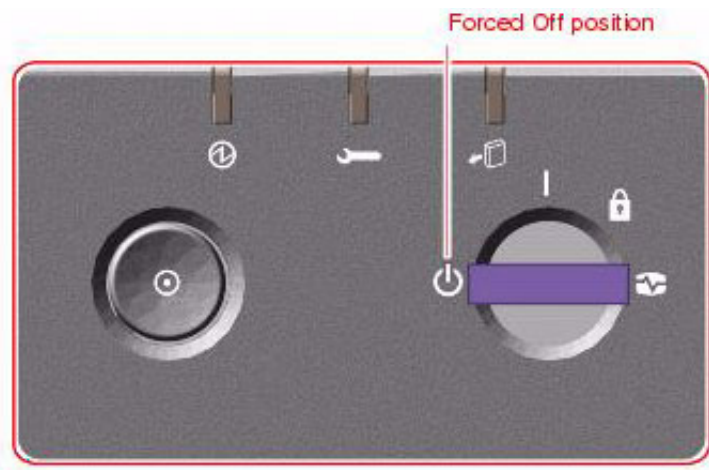
## Shutting down the system

To shut down the system:

1. Enter:  

```
/usr/sbin/shutdown -y -i0 -g0
```

  
The system shuts down.
2. Press and release the front panel power button to turn off the system.  
Wait for the front panel Power/OK LED to turn off.
3. Turn the key switch to the Forced Off position. See the following figure.



**DANGER:**

Be sure to turn the key switch to the Forced Off position before handling any internal components. Otherwise, it is possible for a user to restart the system remotely while you are working inside it. The Forced Off position is the only key switch position that prevents an RSC user from restarting the system.

4. Turn off the system monitor.
5. Turn off any external SCSI devices, starting with the device that is closest to the system and working toward the farthest device.



---

## Removing a CPU/Memory board

To add memory or replace a CPU/Memory board, you must first remove the CPU/Memory board.

To remove a CPU/Memory board:

1. Open the right door.
2. Attach one end of an ESD antistatic wrist strap to the system chassis sheet metal and attach the other end to your wrist. See [Using an ESD wrist strap](#) on page 59 for more information.
3. Identify the CPU/Memory board that you want to remove.
4. Loosen, but do not remove, the two captive screws securing the CPU/Memory board. See the following figure.



5. Rotate the CPU/Memory board ejection levers out so that the CPU/Memory board connectors disengage from the motherboard. See the following figure.



6. Pull the CPU/Memory board from the chassis.
7. Place the CPU/Memory board on an antistatic mat or in an antistatic bag.

---

## Replacing memory

This section describes the procedures used to replace memory on a CPU/Memory board that you have already removed from the system (see [Removing a CPU/Memory board](#) on page 137). When replacing memory modules, you must replace modules in groups of four within a bank of memory, even if only one module is defective.



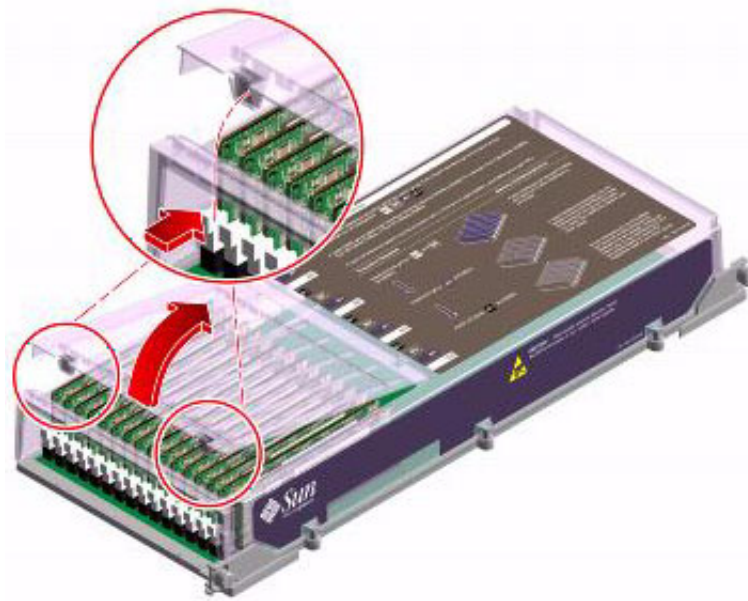
### Tip:

The procedure for replacing memory is summarized on the top of the CPU/Memory board.

To replace memory modules:

1. Attach one end of an ESD antistatic wrist strap to the system chassis sheet metal and attach the other end to your wrist. See [Using an ESD wrist strap](#) on page 59 for more information.

2. Remove the plastic cover on the CPU/Memory board. Push the tabs in until you can lift the cover free of the CPU/Memory board shroud. See the following figure.



3. Identify which modules you are removing.
4. Applying even pressure on both levers, push down on the ejector levers at each end of the memory module until the memory module pops out of the socket. See the following figure.



5. Grasp the top corners of the memory module and pull it up and out of the socket.
6. Place the memory module on an antistatic mat or in an antistatic bag.
7. Push down on the ejector levers at each end of the sockets.

8. Holding the bottom edge of the module parallel to the socket, align the module so that each of the contacts is centered on a socket pin. See the following figure.



9. Push firmly and evenly on both ends of the memory module until the bottom edge is firmly seated in the socket. You will hear a click when the ejection levers are in the locked position.
10. Replace the plastic cover on the CPU/Memory board.
11. Continue with [Installing a CPU/Memory board](#) on page 140.

---

## Installing a CPU/Memory board

Use this procedure to install a new CPU/Memory board or to reinstall a CPU/Memory board that was removed for maintenance.

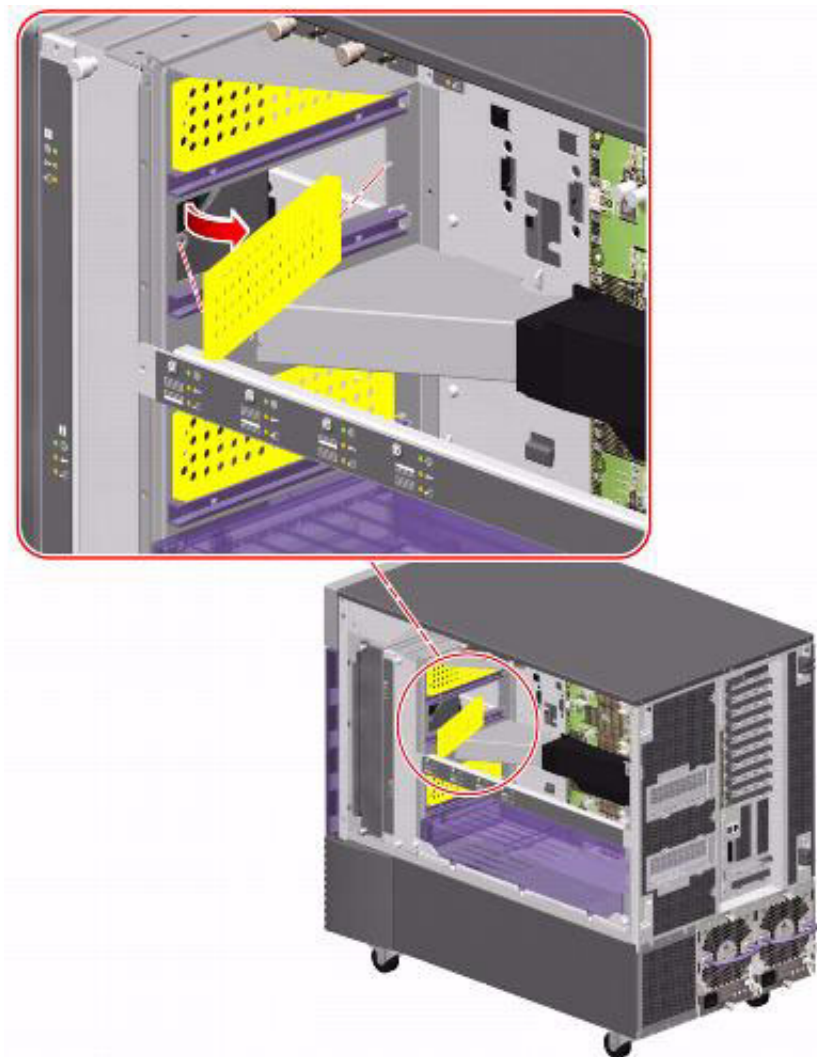
To install a CPU/Memory board:

1. If not already done, open the right door.
2. If not already done, attach one end of an ESD antistatic wrist strap to the system chassis sheet metal and attach the other end to your wrist. See [Using an ESD wrist strap](#) on page 59 for more information.
3. Locate the CPU/Memory board slot into which you want to install the CPU/Memory board.
4. If a CPU/Memory board connector yellow dust cover is installed on the slot's motherboard CPU/Memory board connectors, remove it.

**⚠ WARNING:**

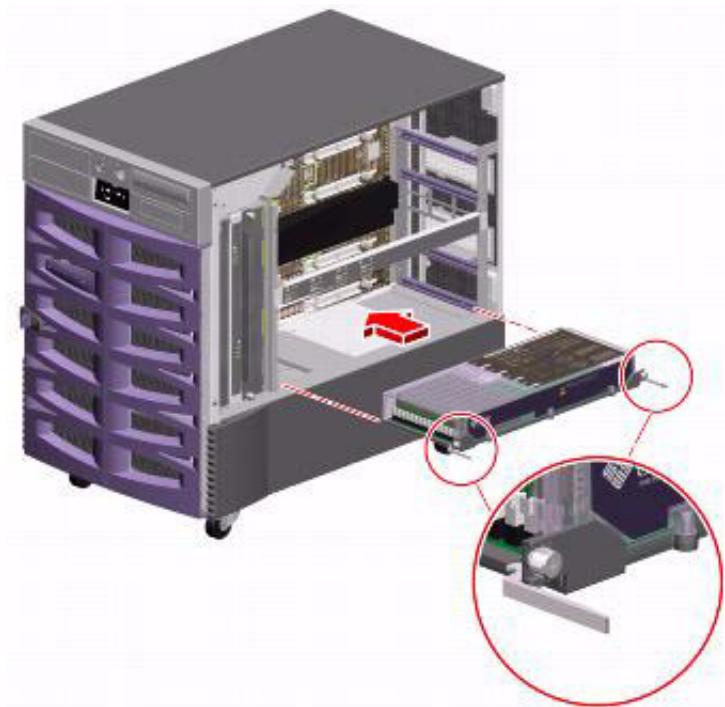
If you do not remove the dust cover from the motherboard CPU/Memory board connectors, installing a CPU/Memory board in that slot may damage the motherboard and the CPU/Memory board.

5. If a CPU air baffle is installed in the CPU/Memory board slot, remove the air baffle. Pull the plastic tab on the air baffle and rotate the baffle from its slot. Place the CPU air baffle into an empty CPU air baffle slot on the underside of the chassis top. See the following figure.



## Maintenance

6. Make sure that the ejection levers on the CPU/Memory board are pointed out, rotated at 90 degrees. See the following figure.



7. Slide the CPU/Memory board into the guides in the chassis. Slide the board into the system until the connectors on the board begin to engage the sockets on the motherboard and the ejection levers begin to contact the bracket.
8. Push in the two ejection levers simultaneously until the board is fully engaged in its slot.
9. Hand-tighten the two captive screws on the CPU/Memory board.
10. Using a No. 2 Phillips screwdriver, fully tighten the right captive screw and repeat for the left captive screw.
11. Remove the ESD wrist strap.
12. Close the side door.

## Restarting the system

To restart the system:

1. Turn on any external SCSI devices, starting with the device that is farthest from the system and working toward the system.
2. Turn on the system monitor.
3. Turn on the system.

This reboots the system so that it recognizes the new configuration.

4. When the system comes back up, log in as root.
5. Enter:

```
/usr/platform/`uname -m`/sbin/prtdiag -v | pg
```

The new memory size, memory configuration, and CPU configuration are displayed in a message similar to the following:

```
System Configuration: Sun Microsystems sun4u Sun Fire V890
System clock frequency: 150 MHz
Memory size: 8192 Megabytes

===== CPUs =====

Brd  CPU   Run   E$   CPU   CPU
      CPU  MHz   MB  Impl.  Mask
-----
A  0, 16 1350 16.0 US-IV   3.1
A  2, 18 1350 16.0 US-IV   3.1

===== Memory Configuration =====

      MC   Logical  Logical  Logical
Brd  ID   Bank   Bank   Bank   DIMM   Interleave  Interleaved
-----
A    0    0    1024MB  no_status  512MB   8-way      0
A    0    1    1024MB  no_status  512MB   8-way      0
A    0    2    1024MB  no_status  512MB   8-way      0
A    0    3    1024MB  no_status  512MB   8-way      0
A    2    0    1024MB  no_status  512MB   8-way      0
A    2    1    1024MB  no_status  512MB   8-way      0
A    2    2    1024MB  no_status  512MB   8-way      0
A    2    3    1024MB  no_status  512MB   8-way      0
.
.
```

## Maintenance

6. Verify that the memory size that is displayed is correct, and compare it to the value that you recorded before you added the new memory. If the new memory size is not correct, shut down the system, turn off the power, and verify that all the memory modules are properly seated.
7. If a one or more CPU/Memory board is added to the system, readminister the Informix IDS tunables as described in the section "Setting the Informix configuration parameters for CMS" in the CMS software installation, maintenance, and troubleshooting document for your CMS release.



---

## Replacing a power supply

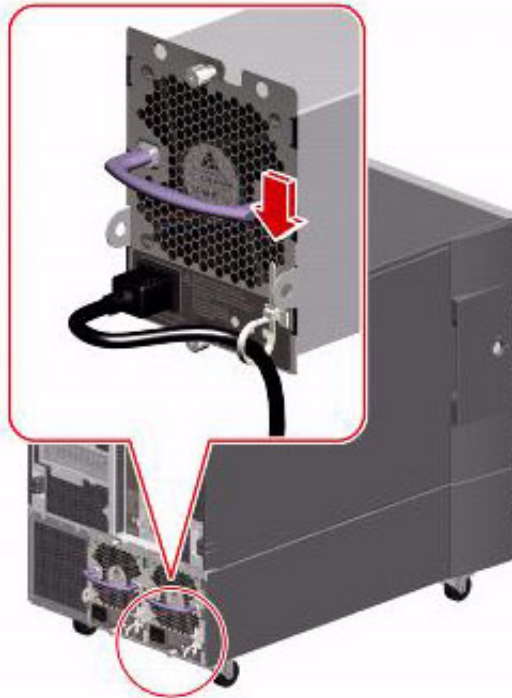
In normal conditions, a power supply can be replaced without shutting down the system. However, a power supply must always occupy bays 0 and 1. If a power supply in bay 0 or 1 fails, you must leave the failed power supply in its bay until you are able to install a functioning replacement power supply. A failed power supply in bay 0 or 1 continues to act as an air baffle, channeling airflow to cool the bottom row of disk drives in the disk cage. Replace the failed power supply as soon as possible to regain power redundancy.

**WARNING:**

You cannot interchange power supplies between a V880 and V890 computer.

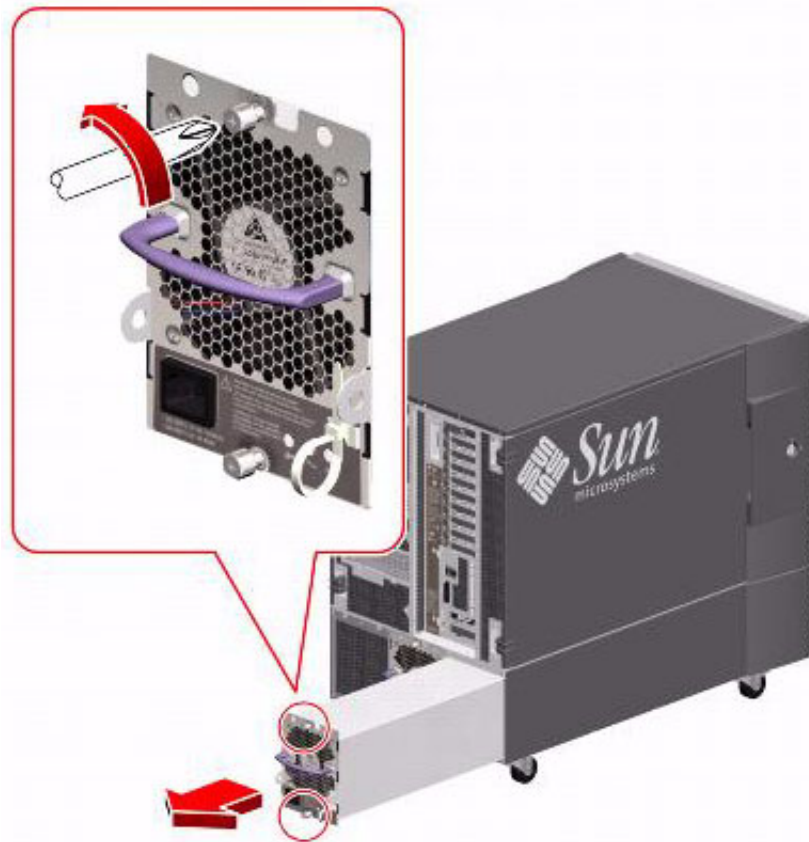
To replace a power supply:

1. Identify the power supply that you want to remove. See [Power supply status indicators](#) on page 181 for information about diagnosing power supplies.
2. Release the AC power cord from the strain-relief tie-wrap on the power supply. Press the tab on the head of the tie-wrap to release it. See the following figure.



3. Unplug the AC power cord from the power supply.

4. Loosen the two captive Phillips screws securing the power supply to the system rear panel. See the following figure.



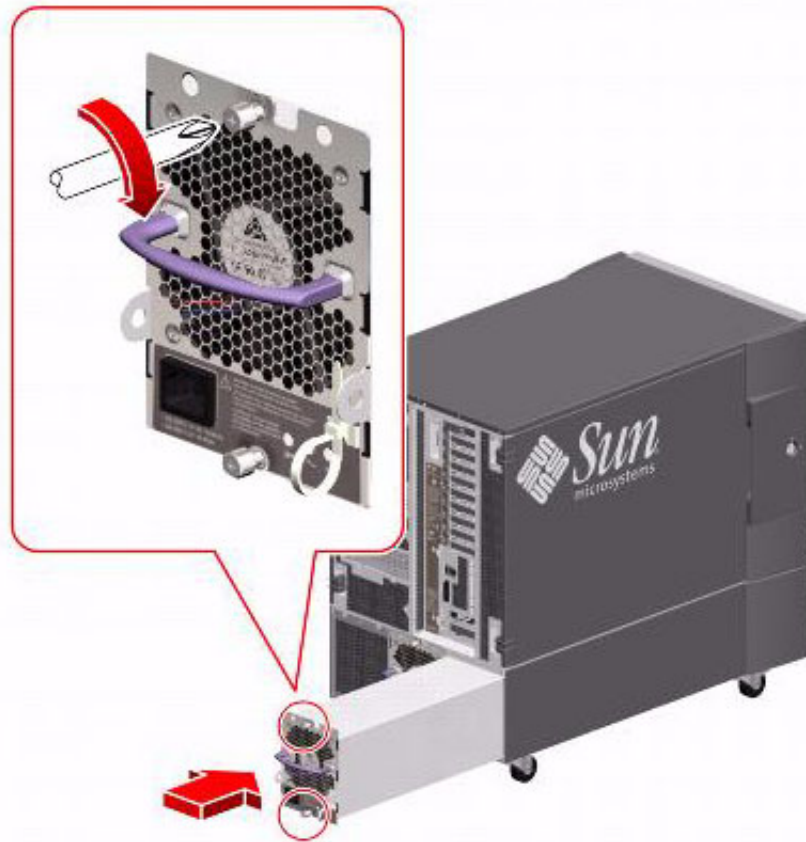
5. Pull the power supply out from its bay. Use one hand to pull the power supply out while using the other hand to support the power supply as it is removed from the system.

**⚠ Important:**

When hot-swapping a power supply, do not disengage and reengage the supply in rapid succession. Rapid seating and unseating of power supplies will result in false error conditions.

6. After removing a supply, wait for an acknowledgement message on the system console before installing a new supply. Otherwise, the environmental monitoring software will not recognize the new device, and false error conditions will result.

7. Slowly slide the new power supply into its bay until the connectors on the power supply are fully engaged with the connectors on the power distribution board. See the following figure.



8. Tighten the two captive screws that secure the power supply to the chassis.
9. Connect the AC power cord to the power supply. Insert the power cord through the strain-relief tie-wrap loop, located to the right of the supply. Tighten the tie-wrap to secure the connection.

**Note:**

You can also replace a power supply when the system is at the boot level (that is, the `ok` prompt is displayed). If a power supply is replaced at the boot level, you must reboot the system using the `reset-all` command.



# Troubleshooting

This section includes the following topics:

- [Using the remote console](#) on page 150
- [Tools](#) on page 157
  - [Using the prtdiag command](#) on page 158
  - [Using the cfgadm command](#) on page 164
  - [System messages](#) on page 165
  - [OpenBoot PROM firmware tests](#) on page 166
  - [OpenBoot diagnostic tests](#) on page 172
  - [POST diagnostic messages](#) on page 175
  - [OpenBoot initialization commands](#) on page 176
  - [Diagnosing status indicators](#) on page 177
  - [Sun Validation Test Suite \(VTS\)](#) on page 185
- [Troubleshooting disk drives and DVD drives](#) on page 186
- [Troubleshooting tape drives](#) on page 190
- [Recovery procedures](#) on page 193

**Additional troubleshooting:** See the *Sun Fire 880 Service Manual* or *Sun Fire V890 Service Manual* at the Sun documentation Web site for additional troubleshooting procedures:

<http://docs.sun.com>

## Using the remote console

If your system does not boot, or if the system cannot be diagnosed locally, remote support personnel might want to redirect control of the console port from the local console to a dialed-in remote console. Redirecting the console allows support personnel to do maintenance remotely as if they were at the local console. You can redirect the console using either:

- The Solaris operating system
- OpenBoot diagnostics

This section consists of the following procedures:

- [Redirecting the console using Solaris](#) on page 150. Use this procedure when the system will boot up to the Solaris operating system.
- [Redirecting the console using OpenBoot mode](#) on page 153. Use this procedure when the system will not boot up to the Solaris operating system.

## Redirecting the console using Solaris

The following procedure describes how to use the Solaris operating system to redirect the local console to the serial port and is usually done from the remote console that has dialed in to the system. Should you encounter any problems setting up the remote console, see [Remote console port problems](#) on page 200 for troubleshooting procedures.



### CAUTION:

Use the following procedure only when absolutely necessary. If the console redirects and the modem line drops, you may not be able to get back into the system.

## Redirecting the local console to the remote console

To redirect control of the console port from the local console to a dialed-in remote console:

1. Dial in from the remote console to the remote console modem, and log in as root.
2. At the remote console, enter:

```
/cms/install/bin/abcmadm -r ttya
```

The following message is displayed at the remote console:

```
ttya is currently set to be incoming
Are you sure you want to change it? [y,n,?]
```

3. At the remote console, enter: **y**

The following message is displayed at the remote console:

```
ttya administration removed
```

4. At the remote console, enter:

```
/cms/install/bin/abccadm -c -b 9600 ttya
```

The following message is displayed at the remote console:

```
This change requires a reboot to take affect  
Are you ready to reboot? [y,n,?]
```

5. At the remote console, enter: **y**

The following message is displayed at the remote console:

```
done  
desktop auto-start disabled  
Proceeding to reboot.
```

The following occurs:

- The system begins to shut down.
- Shutdown, reset, and reboot messages are displayed on the local console.
- When the system starts to come back up, the local console goes blank.
- The system boot diagnostics are displayed on the remote console.
- After the system reboots, a **console login:** prompt is displayed on the remote console.

6. Log in to the remote console as root.

## Redirecting the remote console back to the local console



### CAUTION:

Do not enter **Ctrl+D** from the remote console to exit the system without first redirecting control back to the local console. If you do, you may lock yourself from using the console locally or remotely.

To redirect control of the console port from the remote console back to the local console:

1. At the remote console, enter:

```
/cms/install/bin/abcadm -c local
```

The following message is displayed at the remote console:

```
Console set to local  
  
This change requires a reboot to take affect  
  
Are you ready to reboot? [y,n,?]
```

2. At the remote console, enter: **y**

The following occurs:

- The system begins to shut down.
  - Shutdown, reset, and reboot messages are displayed on the local console.
  - When the system starts to come back up, the system boot diagnostics are displayed on the local console.
  - After the system reboots, the **console login:** prompt is displayed on the remote console.
  - The login screen is displayed on the local console.
3. Log in to the local console as root.
  4. Log in to the remote console as root.

Control of the console port is redirected from the remote console back to the local console.



## Redirecting the console using OpenBoot mode

This procedure describes how to use the OpenBoot mode to redirect the local console to serial port A. Use the OpenBoot mode to redirect the remote console port when the Solaris method does not work. This typically occurs when the system will not boot.

### Redirecting the local console to the remote console

To redirect control of the console port from the local console to a dialed-in remote console:

1. If the system is not already at the `ok` prompt, enter:

```
/usr/sbin/shutdown -y -i0 -g0
```

The system shuts down to the `ok` prompt.



#### CAUTION:

If the shutdown command fails, press **Stop+A** simultaneously after the console banner is displayed, but before the operating system starts booting.

2. At the local console, enter the following commands to set the remote console configuration parameters:

```
setenv input-device ttya
setenv output-device ttya
setenv ttya-rts-dtr-off true
setenv ttya-ignore-cd true
setenv ttya-mode 9600,8,n,1,-
```

3. To verify the parameter changes, enter:

```
printenv
```

The following message is displayed:

Parameter Name	Value	Default Value
output-device	ttya	screen
input-device	ttya	keyboard
.		
.		
.		

4. If not already dialed in, dial in to the system from the remote console.
5. Log in to the system as root.

6. At the local console, enter:

**boot**

The following occurs:

- The system begins to shut down.
- Shutdown, reset, and reboot messages are displayed on the local console.
- When the system starts to come back up, the local console goes blank.
- The system boot diagnostics are displayed on the remote console.
- After the system reboots, a **console login:** prompt is displayed on the remote console.

7. Log in to the remote console as root.

## Redirecting the remote console back to the local console



### CAUTION:

Do not enter **Ctrl+D** from the remote console to exit the system without first redirecting control back to the local console. If you do, you may lock yourself from using the console locally or remotely.

Using OpenBoot mode, there are two ways to redirect control of the console port from the remote console back to the local console:

- [Method 1: from the remote console](#) on page 155 (recommended)
- [Method 2: from the local site](#) on page 156 (not recommended)

**Method 1: from the remote console :** To redirect control of the console port from the remote console back to the local console:

1. Do one of the following:

- If the system is in UNIX, enter the following commands at the remote console:

```
eeeprom output-device=screen
eeeprom input-device=keyboard
eeeprom tttya-rts-dtr-off=true
eeeprom tttya-ignore-cd=false
/usr/sbin/shutdown -y -i6 -g0
```

- If the system is in OpenBoot mode, enter the following commands at the remote console:

```
setenv output-device screen
setenv input-device keyboard
setenv tttya-rts-dtr-off true
setenv tttya-ignore-cd false
reset
```

The following occurs:

- The system begins to shut down.
  - Shutdown, reset, and reboot messages are displayed on the remote console.
  - When the system starts to come back up, the system boot diagnostics are displayed on the local console.
  - The login screen is displayed on the local console.
2. At the remote console, hang up the modem connection.
3. Log in to the system as root at the local console.
4. To see what is on the tttya port, enter:
- ```
/cms/install/bin/abccadm -k
```
5. To start a port monitor on tttya, enter:
- ```
/cms/install/bin/abccadm -i -b 9600 tttya
```

**Method 2: from the local site:** The onsite technician will use this procedure from the local site. Use this method only when Method 1 will not work.



**CAUTION:**

This method of redirecting the console port should be done only as a last resort. This procedure resets the NVRAM defaults to the Sun factory settings. These settings will remain in effect until the next reboot. This procedure could also cause loss of data and disk failure, and could require a disk restore.

To redirect control of the console port from the remote console back to the local console:

1. Turn the power off and back on for the CMS computer.
2. As the computer begins to boot up, double-click the power button on the front of the system.

**Note:**

Double-clicking the power button during power-up is the equivalent to **Stop+N** on a system that has a non-USB keyboard.

The prompt is displayed on the local console.

3. At the `ok` prompt, enter:

`boot`

4. When the system boots up, log in to the system as root at the local console.
5. To see what is on the `ttya` port, enter:

`/cms/install/bin/abcaadm -k`

6. To start a port monitor on `ttya`, enter:

`/cms/install/bin/abcaadm -i -b 9600 ttya`

The following message is displayed:

```
ttya set to incoming port 9600 baud
```

---

## Tools

There are several tools available to help diagnose hardware problems. The tools are described in the following sections:

- [Using the prtdiag command](#) on page 158
- [Using the cfgadm command](#) on page 164
- [System messages](#) on page 165
- [OpenBoot PROM firmware tests](#) on page 166
- [OpenBoot diagnostic tests](#) on page 172
- [POST diagnostic messages](#) on page 175
- [OpenBoot initialization commands](#) on page 176
- [Diagnosing status indicators](#) on page 177
- [Sun Validation Test Suite \(VTS\)](#) on page 185

# Using the prtdiag command

The **prtdiag** command displays system diagnostic information.

To display this diagnostic information, enter:

```
/usr/platform/'uname -m'/sbin/prtdiag -v | pg
```

The following is an example of the results for the V880 computer.

```
System Configuration: Sun Microsystems sun4u Sun Fire 880
System clock frequency: 150 MHz
Memory size: 4096 Megabytes
===== CPUs =====
```

Brd	CPU	Run MHz	E\$ MB	CPU Impl.	CPU Mask
A	0	1200	8.0	US-III+	11.1
A	2	1200	8.0	US-III+	11.1

```
===== Memory Configuration =====
```

Brd	MC ID	Logical Bank num	Logical Bank size	Logical Bank Status	DIMM Size	Interleave Factor	Interleaved with
A	0	0	512MB	no_status	256MB	8-way	0
A	0	1	512MB	no_status	256MB	8-way	0
A	0	2	512MB	no_status	256MB	8-way	0
A	0	3	512MB	no_status	256MB	8-way	0
A	2	0	512MB	no_status	256MB	8-way	0
A	2	1	512MB	no_status	256MB	8-way	0
A	2	2	512MB	no_status	256MB	8-way	0
A	2	3	512MB	no_status	256MB	8-way	0

```
===== IO Cards =====
```

Brd	IO Type	Port ID	Bus Side	Slot	Bus Freq MHz	Max Bus Freq MHz	Dev, Func	State	Name
I/O	PCI	8	B	3	33	33	2,0	ok	pci1214,334-pci1214,334.10
I/O	PCI	8	B	2	33	33	3,0	ok	pci108e,1000-pci108e,1000.1
I/O	PCI	8	B	2	33	33	3,1	ok	SUNW,hme-pci108e,1001SUNW,qsi-cheerio
I/O	PCI	8	B	1	33	33	4,0	ok	pci108e,1000-pci108e,1000.1
I/O	PCI	8	B	1	33	33	4,1	ok	SUNW,hme-pci108e,1001SUNW,qsi-cheerio
I/O	PCI	8	B	0	33	33	5,0	ok	pci-pci8086,b152.0/pci108e,1000PCI-BRIDGE
I/O	PCI	8	B	0	33	33	0,0	ok	pci108e,1000-pci108e,1000.1device on pci-bridge
I/O	PCI	8	B	0	33	33	0,1	ok	SUNW,hme-pci108e,1001SUNW,cheerio/pci-bridg+
I/O	PCI	8	B	0	33	33	4,0	ok	SUNW,isptwo-pci1077,1020/sd (blo+QLGC,ISP1040B/pci-bridg+
I/O	PCI	9	B	4	33	33	4,0	ok	pci1214,334-pci1214,334.10
I/O	PCI	9	A	7	33	66	2,0	ok	SUNW,m64BSUNW,370-4362

```
No failures found in System
=====
```

```
===== Environmental Status =====
```

```
System Temperatures (Celsius):
```

```
-----
Device           Temperature      Status
-----
CPU0              63              OK
CPU2              70              OK
MB                29              OK
IOB               25              OK
DBP0              24              OK
```

```
=====
```

```
Front Status Panel:
```

```
-----
Keyswitch position: NORMAL
```

```
System LED Status:
```

```

GEN FAULT          REMOVE
[OFF]              [OFF]

DISK FAULT          POWER FAULT
[OFF]              [OFF]

LEFT THERMAL FAULT  RIGHT THERMAL FAULT
[OFF]              [OFF]

LEFT DOOR           RIGHT DOOR
[OFF]              [OFF]
```

```
=====
```

```
Disk Status:
```

```

Presence      Fault LED      Remove LED
DISK  0: [PRESENT]      [OFF]      [OFF]
DISK  1: [PRESENT]      [OFF]      [OFF]
DISK  2: [  EMPTY]
DISK  3: [PRESENT]      [OFF]      [OFF]
DISK  4: [PRESENT]      [OFF]      [OFF]
DISK  5: [  EMPTY]
DISK  6: [  EMPTY]
DISK  7: [  EMPTY]
DISK  8: [  EMPTY]
DISK  9: [  EMPTY]
DISK 10: [  EMPTY]
DISK 11: [  EMPTY]
```

```
=====
```

## Troubleshooting

Fan Bank :

-----

Bank	Speed ( RPMS )	Status	Fan State
----	-----	-----	-----
CPU0_PRIM_FAN	2158	[ENABLED]	OK
CPU1_PRIM_FAN	2307	[ENABLED]	OK
CPU0_SEC_FAN	0	[DISABLED]	OK
CPU1_SEC_FAN	0	[DISABLED]	OK
IO0_PRIM_FAN	4054	[ENABLED]	OK
IO1_PRIM_FAN	4000	[ENABLED]	OK
IO0_SEC_FAN	0	[DISABLED]	OK
IO1_SEC_FAN	0	[DISABLED]	OK
IO_BRIDGE_PRIM_FAN	3448	[ENABLED]	OK
IO_BRIDGE_SEC_FAN	0	[DISABLED]	OK

=====

Power Supplies:

-----

Supply	Status	Fan Fail	Temp Fail	CS Fail	3.3V	5V	12V	48V
-----	-----	-----	-----	-----	---	---	---	---
PS0	GOOD				6	4	2	2
PS1	GOOD				6	4	2	2
PS2	GOOD				6	4	2	2

===== HW Revisions =====

System PROM revisions:

-----

OBP 4.13.0 2004/01/19 18:26

IO ASIC revisions:

-----

Brd	Model	Port ID	Status	Version
----	-----	----	-----	-----
IB-1	unknown	8	ok	7
IB-1	unknown	9	ok	7



The following is an example of the results for the V890 computer.

```

System Configuration: Sun Microsystems sun4u Sun Fire V890
System clock frequency: 150 MHz
Memory size: 8192 Megabytes

===== CPUs =====

  Run  E$  CPU   CPU
Brd CPU MHz  MB Impl. Mask
---
A  0, 16 1350 16.0 US-IV 3.1
A  2, 18 1350 16.0 US-IV 3.1

===== Memory Configuration =====

  Logical Logical Logical
  Bank  Bank  Bank
Brd MC ID num size Status DIMM Interleave Interleaved
---
A  0  0  0 1024MB no_status 512MB 8-way 0
A  0  1  1 1024MB no_status 512MB 8-way 0
A  0  2  2 1024MB no_status 512MB 8-way 0
A  0  3  3 1024MB no_status 512MB 8-way 0
A  2  0  0 1024MB no_status 512MB 8-way 0
A  2  1  1 1024MB no_status 512MB 8-way 0
A  2  2  2 1024MB no_status 512MB 8-way 0
A  2  3  3 1024MB no_status 512MB 8-way 0

===== IO Cards =====

  Bus Max
  Freq Bus Dev,
IO Port Bus Slot MHz Freq Func State Name
Brd Type ID Side Slot MHz Freq Func State Name
Model
-----
I/O PCI 8 B 1 33 33 4,0 ok SUNW,XVR-100 SUNW,375-3181
I/O PCI 8 B 0 33 33 5,0 ok scsi-pci1000,30.1000.10c0.7/disk+LSI,1030
I/O PCI 8 B 0 33 33 5,1 ok scsi-pci1000,30.1000.10c0.7/disk+LSI,1030
I/O PCI 9 B 6 33 33 2,0 ok pci-pci8086,b154.0/pci (pci) PCI-BRIDGE
I/O PCI 9 B 6 33 33 0,0 ok pci-pci8086,b154.0/network (netw+ pci-bridge/pci-bridge
I/O PCI 9 B 6 33 33 0,0 ok network-pci100b,35.30 SUNW,pci-qge/pci-bridg+
I/O PCI 9 B 6 33 33 1,0 ok network-pci100b,35.30 SUNW,pci-qge/pci-bridg+
I/O PCI 9 B 6 33 33 4,0 ok pci-pci8086,b154.0/network (netw+ pci-bridge/pci-bridge
I/O PCI 9 B 6 33 33 2,0 ok network-pci100b,35.30 SUNW,pci-qge/pci-bridg+
I/O PCI 9 B 6 33 33 3,0 ok network-pci100b,35.30 SUNW,pci-qge/pci-bridg+

No failures found in System
=====

```

```
===== Environmental Status =====

System Temperatures (Celsius):
-----
Device           Temperature      Status
-----
CPU0              73              OK
CPU2              76              OK
MB                31              OK
IOB               28              OK
DBP0              29              OK

=====

Front Status Panel:
-----
Keyswitch position: NORMAL

System LED Status:

                GEN FAULT                REMOVE
                [OFF]                    [OFF]

                DISK FAULT                POWER FAULT
                [OFF]                    [OFF]

                LEFT THERMAL FAULT        RIGHT THERMAL FAULT
                [OFF]                    [OFF]

                LEFT DOOR                 RIGHT DOOR
                [OFF]                    [OFF]

=====

Disk Status:

      Presence      Fault LED      Remove LED
DISK  0: [PRESENT]   [OFF]         [OFF]
DISK  1: [PRESENT]   [OFF]         [OFF]
DISK  2: [  EMPTY]
DISK  3: [PRESENT]   [OFF]         [OFF]
DISK  4: [PRESENT]   [OFF]         [OFF]
DISK  5: [  EMPTY]
DISK  6: [  EMPTY]
DISK  7: [  EMPTY]
DISK  8: [  EMPTY]
DISK  9: [  EMPTY]
DISK 10: [  EMPTY]
DISK 11: [  EMPTY]

=====
```

## Fan Bank :

-----

Bank	Speed ( RPMS )	Status	Fan State
----	-----	-----	-----
CPU0_PRIM_FAN	2307	[ENABLED]	OK
CPU1_PRIM_FAN	2419	[ENABLED]	OK
CPU0_SEC_FAN	0	[DISABLED]	OK
CPU1_SEC_FAN	0	[DISABLED]	OK
IO0_PRIM_FAN	3125	[ENABLED]	OK
IO1_PRIM_FAN	3030	[ENABLED]	OK
IO0_SEC_FAN	0	[DISABLED]	OK
IO1_SEC_FAN	0	[DISABLED]	OK
IO_BRIDGE_PRIM_FAN	3529	[ENABLED]	OK
IO_BRIDGE_SEC_FAN	0	[DISABLED]	OK

=====

## Power Supplies:

-----

Supply	Status	Fan Fail	Temp Fail	CS Fail	3.3V	5V	12V	48V
-----	-----	-----	-----	-----	----	----	----	----
PS0	GOOD				6	4	2	2
PS1	GOOD				6	4	2	2
PS2	GOOD				6	4	2	2

===== HW Revisions =====

## System PROM revisions:

-----

OBP 4.15.1 2004/06/02 16:06

## IO ASIC revisions:

-----

Brd	Model	Port ID	Status	Version
----	-----	----	-----	-----
IB-1	unknown	8	ok	7
IB-1	unknown	9	ok	7

## Using the `cfgadm` command

The `cfgadm` command displays diagnostic information about CPU/Memory boards, SCSI controllers, and PCI cards.

To display this diagnostic information, enter:

**`cfgadm`**

The following is an example of the results for the computer.

Ap_Id	Type	Receptacle	Occupant	Condition
c0	scsi-bus	connected	configured	unknown
c2	scsi-bus	connected	configured	unknown
c3	scsi-bus	connected	unconfigured	unknown
pcisch0:hpc1_slot0	mult/hp	connected	configured	ok
pcisch0:hpc1_slot1	vgs8514/hp	connected	configured	ok
pcisch0:hpc1_slot2	unknown	empty	unconfigured	unknown
pcisch0:hpc1_slot3	unknown	empty	unconfigured	unknown
pcisch2:hpc2_slot4	unknown	empty	unconfigured	unknown
pcisch2:hpc2_slot5	unknown	empty	unconfigured	unknown
pcisch2:hpc2_slot6	pci-pci/hp	connected	configured	ok
pcisch3:hpc0_slot7	unknown	empty	unconfigured	unknown
pcisch3:hpc0_slot8	unknown	empty	unconfigured	unknown
usb0/1	usb-mouse	connected	configured	ok
usb0/2	usb-kbd	connected	configured	ok
usb0/3	unknown	empty	unconfigured	ok
usb0/4	unknown	empty	unconfigured	ok

- `c0` shows the status of the internal SCSI controller.
- `c2` and `c3` show the status of the SCSI controllers on the Dual Ultra320 SCSI card.
- `pcisch0` through `pcisch3` show the status of the PCI slots. In this example, the following cards are installed:
  - Slot 0 - Dual Ultra320 SCSI card
  - Slot 1 - Graphics card
  - Slot 8 - Quad GigaSwift Ethernet card

---

## System messages

System messages can alert you to system problems, such as a device that is about to fail. By default, many of the messages are displayed on the system console and are stored in `/var/adm`.

You can display system messages with the `dmesg` command. Here are some factors to keep in mind:

- A list of the most recent messages is displayed.
- The `/var/adm` directory contains several message files. The most recent messages are in `/var/adm/messages` and in `/var/adm/messages.0`. The oldest are in `/var/adm/messages.3`.
- Periodically, a new file is created, and the `/var/adm/messages.3` file is deleted, `/var/adm/messages.2` is renamed `/var/adm/messages.3`, `/var/adm/messages.1` is renamed `/var/adm/messages.2`, and `/var/adm/messages.0` is renamed `/var/adm/messages.1`.

The message files may contain not only system messages, but also core dumps and other data, which can cause `/var/adm` to grow quite large. To keep the directory to a reasonable size and ensure that future core dumps can be saved, you should remove unneeded files periodically. You can automate the task by using `crontab`. See your Sun system documentation for information on `crontab`.

---

## OpenBoot PROM firmware tests

The OpenBoot PROM (OBP) on-board firmware performs a routine set of firmware and hardware tests.

**Note:**

Different versions of Solaris have different versions of the OpenBoot commands. Not all commands are available with every version.

This section includes the following topics:

- [Using the OpenBoot PROM tests](#) on page 166
- [Test descriptions](#) on page 167
- [Probing disk drives](#) on page 168
- [Probing all SCSI media devices](#) on page 169

## Using the OpenBoot PROM tests

To use the OpenBoot PROM tests:

1. From the root login, turn off CMS.
2. Enter:  

```
/usr/sbin/shutdown -y -i0 -g0
```

The system shuts down.
3. At the `ok` prompt, enter the following commands:  

```
setenv auto-boot? false  
reset-all
```

The system resets and displays the `ok` prompt.
4. Enter any of the commands that are shown in [Test descriptions](#) on page 167.
5. When you finish testing, enter the following commands:



**CAUTION:**

If you fail to enter these commands, any reboots that you do in the future will stop at the boot prompt instead of proceeding through the normal boot-up process.

```
setenv auto-boot? true  
boot
```

The system reboots.

## Test descriptions

The following table lists some of the OpenBoot PROM On-Board firmware test commands. Note that for some commands, test results are displayed. For other commands, the **ok** prompt is displayed when the test is finished.

Command	Description
<b>probe-ide</b>	Displays the recognized V890 IDE DVD drive.
<b>probe-scsi</b>	Displays the recognized disk drives and backplanes.
<b>probe-scsi-all</b>	Displays the recognized disk drives, backplanes, tape drives, and V880 SCSI DVD drives.
<b>show-devs</b>	Displays all the devices known to the system directly beneath a given device in the device hierarchy. When using <b>show-devs</b> by itself, the command shows the entire device tree.
<b>show-disks</b>	Displays all disk devices.
<b>test-all</b>	Runs a series of tests on the network and on hardware components. The test may take several minutes to complete. You can use <b>Stop+A</b> to stop the tests.
<b>test devalias</b>	Runs the self-test method of the specified device. Use the <b>devalias</b> command to display a list of device aliases that can be tested. You must enter the full path name of the device alias to run the test. For example, to test the DVD-ROM drive, enter:  <code>test /pci@8,700000/scsi@1/disk@6,0:f</code>
<b>watch-clock</b>	Tests the clock function.
<b>watch-net</b>	Runs a loopback test, a transceiver test, and a packet transmission test.
<b>watch-net-all</b>	Runs a loopback test, a transceiver test, a packet transmission test, and tests on the ethernet ports.

**Additional references:** See *Sun OpenBoot 4.x Command Reference Manual* at the following Sun documentation Web site for more information:

<http://docs.sun.com>

## Probing disk drives

This test checks all disk drives.

**Symptom:** The internal disk drives are reporting errors.

**Solution:** To check the status of the disk drives:

1. Enter:

```
/usr/sbin/shutdown -y -i0 -g0
```

This shuts down the system.

2. At the **ok** prompt, enter the following commands:

```
setenv auto-boot? false
```

```
reset-all
```

The system resets.

3. Enter:

```
probe-scsi
```

The program displays a message that is similar to the following:

LiD	HA	LUN	Port	WWN	Disk description
0	0	0	21000004cf72f08f	SEAGATE	ST373405FSUN3660438
1	1	0	21000004cf721553	SEAGATE	ST373405FSUN3660438
2	2	0	21000004cf7213ea	SEAGATE	ST373405FSUN3660438
6	6	0	508002000016b5b1	SUNW	SUNWGS INT FCBPL9224
3	3	0	21000004cf72114b	SEAGATE	ST373405FSUN3660438
4	4	0	21000004cf7211ae	SEAGATE	ST373405FSUN3660438
5	5	0	21000004cf7214a3	SEAGATE	ST373405FSUN3660438

**Note:**

The actual response depends on the number of disk drives that are installed in the system. This example shows six disk drives and the disk drive backplane.

4. Fix any obvious errors, such as disconnected backplane cables or disk drives not completely inserted.
5. When you finish testing, enter the following commands:



**CAUTION:**

If you fail to enter these commands, any reboots that you do in the future will stop at the boot prompt instead of proceeding through the normal boot-up process.

```
setenv auto-boot? true
```

```
boot -r
```

The system reboots.



## Probing all SCSI media devices

This test checks all media devices.

**Symptom:** The tape, DVD, or external disk drives are reporting errors.

**Solution:** To check the status of the media devices:

1. Enter:

```
/usr/sbin/shutdown -y -i0 -g0
```

to shut down the system.

2. At the **ok** prompt, enter the following commands:

```
setenv auto-boot? false
```

```
reset-all
```

The system resets.

3. Enter:

```
probe-scsi-all
```

The program displays a message that is similar to the following:

```
/pci@8,600000/SUNW,qlc@2
LiD HA LUN --- Port WWN --- -----Disk description -----
0 0 0 21000004cf72f08f SEAGATE ST373405FSUN3660438
1 1 0 21000004cf721553 SEAGATE ST373405FSUN3660438
2 2 0 21000004cf7213ea SEAGATE ST373405FSUN3660438
6 6 0 508002000016b5b1 SUNW SUNWGS INT FCBPL9224
3 3 0 21000004cf72114b SEAGATE ST373405FSUN3660438
4 4 0 21000004cf7211ae SEAGATE ST373405FSUN3660438
5 5 0 21000004cf7214a3 SEAGATE ST373405FSUN3660438

/pci@8,700000/scsi@1
Target 5
Unit 0 Removeable Tape HP C5683A C005
Target 6
Unit 0 Removeable Read Only device TOSHIBA DVD-ROM SD-M14011009
/pci@8,700000/pci@5/SUNW,lsptwo@4
```

**Note:**

The actual devices that are listed depends on the devices that are installed in the system. This example shows six disk drives, the disk backplane, the tape drive (target 5), and the DVD drive (target 6).

4. Fix any obvious errors, such as disconnected cables or external drives without power.

- When you finish testing, enter the following commands:

**CAUTION:**

If you fail to enter these commands, any reboots that you do in the future will stop at the boot prompt instead of proceeding through the normal boot-up process.

```
setenv auto-boot? true
```

```
boot -r
```

The system reboots.

### Probing the IDE DVD device (V890 only)

This test checks the DVD drive on the V890.

**Symptom:** The DVD is reporting errors.

**Solution:** To check the status of the DVD device:

- Enter:

```
/usr/sbin/shutdown -y -i0 -g0
```

to shut down the system.

- At the **ok** prompt, enter the following commands:

```
setenv auto-boot? false
```

```
reset-all
```

The system resets.

- Enter:

```
probe-ide
```

The program displays a message that is similar to the following:

```
Device 0 ( Primary Master )
      Removeable ATAPI Model: TOSHIBA DVD-ROM SD-M1712

Device 1 ( Primary Slave )
      Not Present
```

- Fix any obvious errors, such as disconnected cables or external drives without power.

5. When you finish testing, enter the following commands:

**CAUTION:**

If you fail to enter these commands, any reboots that you do in the future will stop at the boot prompt instead of proceeding through the normal boot-up process.

```
setenv auto-boot? true
```

```
boot -r
```

The system reboots.

## OpenBoot diagnostic tests

OpenBoot Diagnostics (OBdiag) is a menu-driven diagnostic tool that diagnoses system hardware.

OBdiag performs root-cause failure analysis on the referenced devices by testing internal registers, confirming subsystem integrity, and verifying device functionality.

To use the OpenBoot diagnostic tests:

1. From the root login, turn off CMS.

2. Enter:

```
/usr/sbin/shutdown -y -i0 -g0
```

The system shuts down and the **ok** prompt is displayed.

3. Set the key switch to the diagnostics position.
4. At the **ok** prompt, enter the following commands:

```
setenv auto-boot? false
```

```
reset-all
```

The system resets.

5. Enter:

```
obdiag
```

This loads the test program and the test menu is displayed.

6. Do one of the following:

- On the V880, enter:

```
obtest <command number>
```

- On the V890, enter:

```
test <command number>
```

See [Test descriptions](#) on page 173 for a description of each command.

7. When finished with testing, set the key switch to the normal position.
8. Enter the following commands:

```
setenv auto-boot? true
```

```
reset-all
```

The system resets.

## Test descriptions

See the following table for a summary of OpenBoot Diagnostic test commands. The command numbers are not shown since they vary for the different computers.

Command name	Description
SUNW,hme@0,1	<ul style="list-style-type: none"> <li>Resets the Ethernet channel.</li> <li>Performs Ethernet channel engine internal loopback.</li> <li>Enables the LAN data to be routed back to the receive MII data outputs.</li> <li>Enables MII transmit data to be routed to the MII receive data path.</li> <li>Forces the twisted-pair transceiver into loopback mode.</li> </ul>
SUNW,XVR-100@4	Tests the video monitor port.
SUNW,isptwo@4	Tests the external SCSI interfaces.
SUNW,m64B@13	Tests the video monitor port.
SUNW,qlc@2	Tests the registers of the on-board FC-AL controller and subsystem (Loop A).
bbc@1,0	Tests all writable registers in the boot bus controller and then verifies that at least one processor has boot bus access.
bbc@1,500000	
controller@0,16	Tests the base backplane firmware and SSC-100 SES controllers.
controller@0,1a	
controller@0,1c	Tests the expansion backplane firmware and SSC-100 SES controllers. Use only on 12-disk systems.
controller@0,1e	
ebus@1	Tests the PCI configuration registers, DMA control registers, ebus mode registers, and DMA controller functions.
flashprom@0,0	Performs a checksum of the flash PROM containing the OpenBoot firmware.
gpio@1,300600	Tests the registers of the super I/O subsystem.
hot plug-controller@0,	Performs a hot-plug test of the PCI slots.  <b>CAUTION:</b> After the hot-plug test, the PCI cards in the slots are not usable until you reset the system.
hot plug-controller@0,	
hot plug-controller@0,	
hot plug-controller@0,	

Command name	Description
ide@1	Tests the IDE controller.
i2c@1,2e	Tests the devices monitored by the I <sup>2</sup> C environmental monitoring bus (temperature sensors, fans, power supplies, system fault LEDs, thermal fault LEDs, and front panel key switch).
i2c@1,30	
i2c@1,50002e	
i2c@1,500030	
keyboard@x	Tests the USB keyboard.
network@x,x	Tests the ethernet ports, including internal and external loopback tests.
pmc@1,300700	Tests the registers of the power management controller.
rsc-control@1,3062f8	Tests RSC hardware, including RSC serial and Ethernet ports.
rtc@1,300700	Tests the registers of the real-time clock and then tests the interrupt rates.
scsi@1	Tests the on-board SCSI controller and SCSI bus subsystem for internal removable media devices. Checks associated registers and performs a DMA transfer.
serial@1,400000	Tests all possible data rates supported by the ttya and ttyb serial lines and performs an internal and external loopback test on each line at each speed.
USB@1,3	Tests the writable registers of the USB open host controller.
exit	Exits from the OpenBoot diagnostics.

**Additional references:** See *Sun OpenBoot 4.x Command Reference Manual* at the following Sun documentation Web site for more information:

<http://docs.sun.com>

## POST diagnostic messages

To use the Power On Self Test (POST) messages (during a reboot) to diagnose remote hardware problems:

1. At the `ok` prompt, enter:  
`boot`
2. Scan the displayed messages on the screen. Watch for error messages.

You can identify problems more accurately if you are familiar with the system power-on initialization messages. These messages show you the types of functions the system performs at various stages of system start-up. These messages can also show the transfer of control from OpenBoot firmware to POST.

## Memory failure

If POST detects an error, it displays an error message indicating the failing part. If POST detects an error that prevents the system from booting, POST halts execution and returns control to OpenBoot. The last message displayed by POST prior to the `ok` prompt indicates the part you need to replace.

The following is a sample error message for a failed test at DIMM J7900.

```
1>Data Bitwalk on Slave 3
1>          Test Bank 0
3>Bank 0 DIMM 0
3>ERROR: TEST = Bank 0 DIMM 0
3>H/W under test = CPU3 Bank 0 Dimm 0, J7900 side 1
3>MSG =
    *** Test Failed!! ***
3>END_ERROR

1>ERROR: TEST = Data Bitwalk on Slave 3
1>H/W under test = CPU3 Memory
1>MSG = ERROR:      miscompare on mem test!
                Address: 00000030.001b0038
                Expected: 00000000.00100000
                Observed: 00000000.00000000

1>END_ERROR

1>ERROR: TEST = Data Bitwalk on Slave 3
1>H/W under test = CPU3 Memory
1>MSG =
    *** Test Failed!! ***
1>END_ERROR
```

## OpenBoot initialization commands

The following table describes OpenBoot initialization commands that are provided by the system. These commands are useful in some situations in which the system fails to boot.

Command	Description
Press <b>Stop</b>	Bypasses POST. This command does not depend on the security mode.  <b>Note:</b> Some systems bypass POST as a default. In such cases, use the <b>Stop+A</b> key combination to start POST.
Press <b>Stop+A</b>	Stops POST. This command does not work during the first few seconds after the system is reset or when the key switch is in the Locked position.



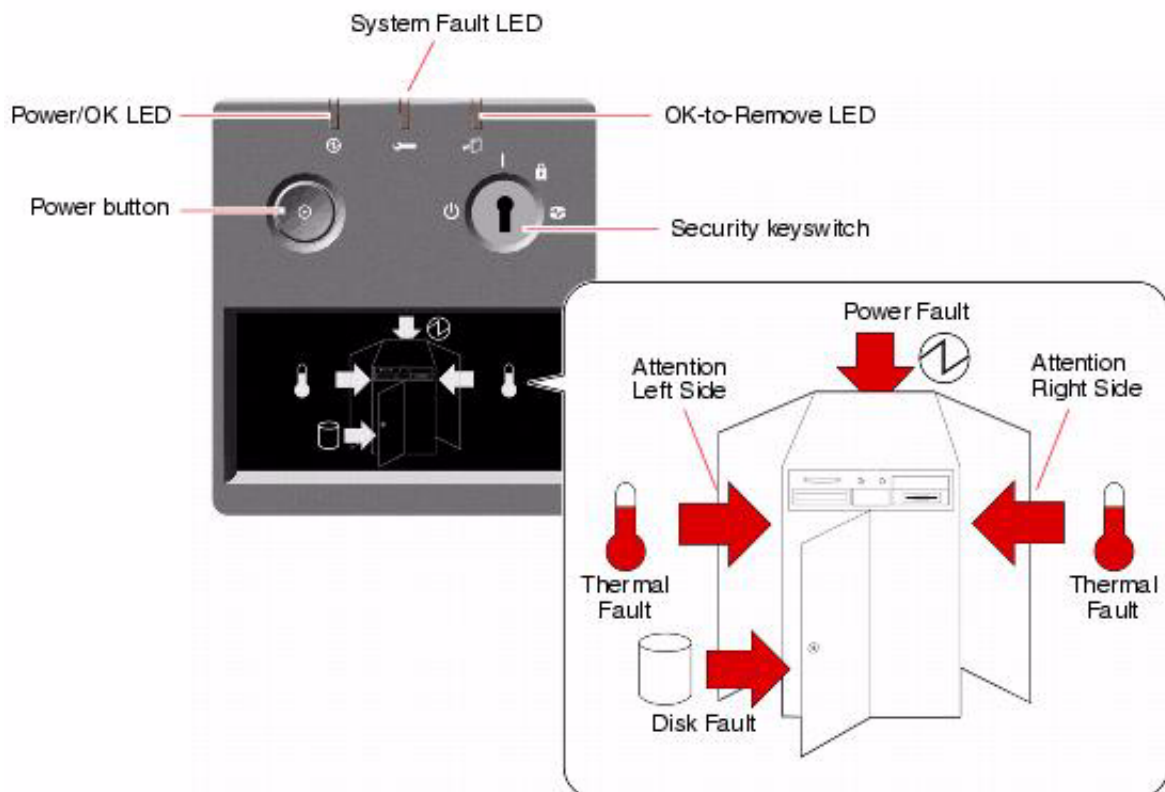
## Diagnosing status indicators

Many hardware components of the computer have LEDs that can be used to diagnose problems. This section describes the following status indicators:

- [Front panel status indicators](#) on page 177
- [PCI slot status indicators](#) on page 179
- [Power supply status indicators](#) on page 181
- [Disk drive status indicators](#) on page 182
- [Tape drive status indicators](#) on page 184

### Front panel status indicators

The system status and control panel, shown in the following figure, includes several status indicators, a power button, and a security key switch.











Several status indicators provide general system status, alert you to system problems, and help you to determine the location of system faults:

- At the top of the status and control panel, three general status LEDs provide a snapshot of the system status.
- Below the power button and security key switch, a graphical display provides additional LED icons to indicate specific fault conditions and locations.

The general status LEDs work in conjunction with the specific fault LED icons. For example, a fault in the disk subsystem illuminates both the system fault LED at the top of the panel and the disk fault icon in the graphical display below it. Fault LEDs within the enclosure help pinpoint the location of the faulty device. Since all front panel status LEDs are powered by the system's 5-volt standby power source, fault LEDs remain lit for any fault condition that results in a system shutdown.

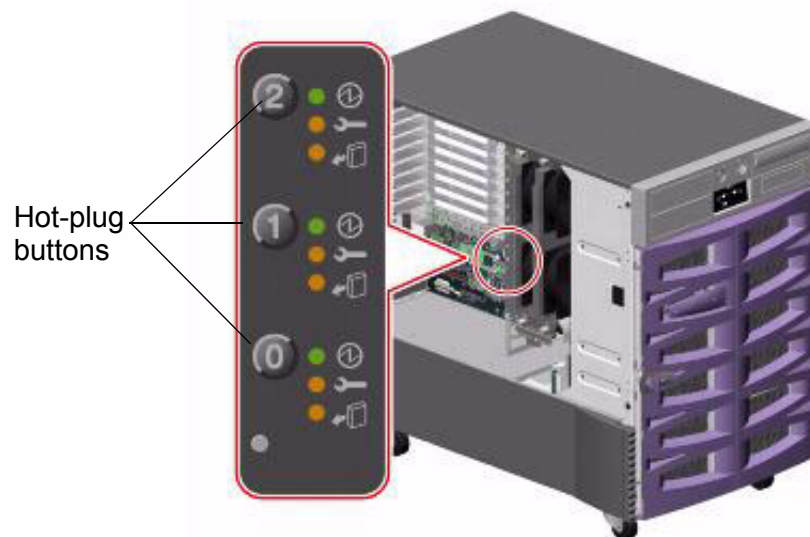
During system startup, the front panel LEDs are individually toggled on and off to verify that each one is working correctly. After that, the front panel LEDs operate as described in the following table.

Name	Icon	LED function
Power/OK		This green LED lights when the system is turned on.
System fault		This amber LED lights to indicate a serious system fault. When this LED is lit, one or more icons in the display panel may also light to indicate the specific nature and location of the fault.
OK-to-remove		This amber LED lights to indicate that an internal hot-pluggable component is ready for removal.
Disk fault		This amber LED lights to indicate a serious disk subsystem fault that is likely to bring down the system. When this LED is lit, one or more disk LEDs may also be lit at the front of the disk cage, indicating the source of the fault. See <a href="#">Disk drive status indicators</a> on page 182.
Power fault		This amber LED lights to indicate a serious power subsystem fault that is likely to bring down the system. When this LED is lit, one or more power supply LEDs may also be lit on the system rear panel. See <a href="#">Power supply status indicators</a> on page 181.




Thermal fault		This amber LED lights to indicate a serious thermal fault (fan fault or overtemperature condition) that is likely to bring down the system. There are two Thermal Fault LEDs in the display to indicate whether the fault is located on the left or right side of the system. In the event of a fan fault, a fault LED inside the system will indicate the faulty fan assembly.
Attention left side		This amber LED lights to indicate that an internal component on the left side of the system requires servicing.
Attention right side		This amber LED lights to indicate that an internal component on the right side of the system requires servicing.

## PCI slot status indicators




The PCI slot LEDs are located on the vertical bracket on the right side of the PCI slots and are visible when the left door is open. There is a hot-plug button and three LEDs for each PCI slot, as shown below.



The PCI slot LEDs are defined as follows:

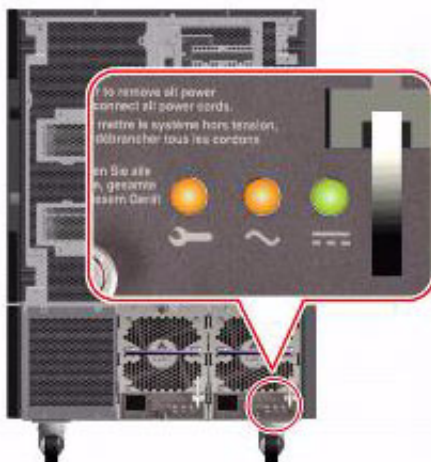
Name	Icon	LED function
Power on		Lights when the slot is receiving power.
Fault		Blinks while the card is being tested, when a hot-plug operation is in progress, or when the card is turned on but logically detached from the operating system. Stays lit if the card encounters a fault.
OK-to-remove		Lights when it is safe to remove the card. <b>Important:</b> If this LED stays lit after inserting a card, you must shut down the system, reinsert the card, and reboot the system. Consult the customer before you shut down the system.

The following table shows how to interpret the PCI slot LED patterns.




Icon			Interpretation
Power on	Fault	OK-to-remove	
			
Off	Off	Off	The slot power is off. A card can be safely inserted to start a hot-plug operation.
On	Blinking	Off	The installed card is being tested, configured, or unconfigured, or the card is turned on but logically detached from the operating system.
On	Off	Off	The slot power is on and the card is operating normally.
Off	On	On	The PCI card has encountered a fault. The card can be safely removed.
Off	Off	On	The card can be safely removed.

## Power supply status indicators

There are three LEDs located on the rear panel of each power supply. See the following figure.



The following table describes the function of each LED.

Name	Icon	LED Function
Fault		Lights when the power supply encounters a fault.
AC-present status		Lights when AC power input is present and within acceptable operating limits.
DC status		Lights when all DC outputs are functional and within acceptable operating limits.

## Disk drive status indicators

The disk fault LED on the system status and control panel indicates the general status of the disk subsystem. The disk fault LED lights when a fault is detected in the disk subsystem. LEDs inside the system indicate the fault status of individual disk drives.




There are three LEDs (Activity, Fault, OK-to-remove) for each disk drive. The disk drive LEDs are located on the front of the disk cage, as shown below.



The disk drive LEDs are defined as follows:

Name	Icon	LED function
Activity		Blinks slowly while the disk drive is being tested, configured, or unconfigured during a hot-plug operation. Blinks rapidly as the disk drive spins up or spins down. Stays lit when the disk drive is at speed and operating normally but experiencing no read or write activity. Blinks rapidly and irregularly in response to disk read or write activity.
Fault		Lights when the disk drive encounters a fault.
OK-to-remove		Lights when it is safe to remove the disk drive during a hot-plug operation. Blinks (under software control) to direct attention to a disk drive.

The following table shows how to interpret the disk drive LED patterns.

Icon			Interpretation
Activity	Fault	OK-to-remove	
			
Off	Off	Off	The slot power is off. A disk drive can be safely inserted as part of a hot-plug operation.
Rapid blinking	Off	Off	The disk drive is spinning up or down.
Slow blinking	Off	Off	The disk drive is being configured or unconfigured during a hot-plug operation.
On	Off	Off	The disk drive is up to speed and operating normally.
Irregular blinking	Off	Off	The disk drive is experiencing read or write activity. This is normal operation.
On	On	Off	The disk drive has encountered a fault.
Off	Off	On	The disk drive can be safely removed as part of a hot-plug operation.

## Tape drive status indicators

The tape drive LEDs show the following status:

- Tape LED (green) - The LED flashes to show activity (loading, unloading, reading, and writing). The LED is steady when a cartridge is loaded and the tape drive is ready to begin operation.
- Clean LED (amber) - The LED flashes to indicate that a cartridge is near the end of its life, or that the heads need cleaning.

The following table describes the LED combinations that occur during normal tape drive operation.

	Tape drive state					
	Activity (load or unload)	Activity (read or write)	Cartridge loaded	Media caution signal	Fault	Power is turned on (starts with two steady lights)
<b>Tape LED (green)</b>	Flashing	Flashing Fast	On	Any	Any	Flashing
<b>Clean LED (amber)</b>	Off	Off	Off	Flashing	On	Off

The tape drive monitors the number of correctable errors that occur during reading and writing. If the number of errors becomes excessive, the tape may be nearing the end of its useful life, or the tape heads may need cleaning. The media caution signal reports the following:

- If the media caution signal displays (flashing amber), clean the tape drive.
- If the signal remains after cleaning the heads, repeat the operation with a different tape. If this clears the signal, the first tape is nearing the end of its life. Copy the data onto a new tape and discard the old one.

The media caution signal is cleared when a new tape is loaded or when the drive is turned off and then turned on.



---

## Sun Validation Test Suite (VTS)

The SunVTS supports diagnostics in the following areas:

- Connection test - Minimal access of device to verify its accessibility and availability.
- Functional test (default) - Detailed tests to thoroughly test the device or system when the system is offline (CMS must be turned off). A stress mode in the system or test option can be set only within the offline mode. The stress mode is an extension of offline.
- Functional test (from system monitor) - Safe tests that can be executed on the device or system when it is online (CMS can be on, but testing is safer when it is turned off).

There are two ways to run SunVTS. Avaya recommends that you use either local access through the Common Desktop Environment (CDE) interface, or remote access using an ASCII interface.

### Prerequisites

CMS must be turned off.

### Using SunVTS

To use SunVTS:

1. Enter:

```
BYPASS_FS_PROBE=1; export BYPASS_FS_PROBE
```

This bypasses the file system probe.

2. Do one of the following:

- Enter:

```
/opt/SUNWvts/bin/sunvts
```

This accesses the CDE interface.

- Enter:

```
/opt/SUNWvts/bin/sunvts -t
```

This accesses the TTY mode (ASCII interface).

**Additional references:** For more information about using SunVTS, see `/opt/SUNWvts/README` and `/opt/SUNWvts/bin/vtstty.help`.

## Troubleshooting disk drives and DVD drives

This section describes the symptoms of disk drive and DVD drive failures and suggests solutions to correct the problem.

**Symptom:** The operating system reports a disk drive read, write, or parity error or reports a DVD drive read error or parity error.

**Solution:** Replace the drive that is indicated in the failure message. The operating system identifies the internal drives as shown in the following table.

Operating system address	Drive physical location and target
c1t<X>d0s0	Disk drive, target <X> (<X> represents the target number and slot number, 0 to 5)
c0t6d0s0	DVD drive, target 6

**Symptom:** The disk drive fails to respond to commands.

**Solution:** To test the disk drives:

1. Enter:

```
/usr/sbin/shutdown -y -i0 -g0
```

The system shuts down.

2. At the **ok** prompt, enter the following commands:

```
setenv auto-boot? false
```

```
reset-all
```

The system resets.

3. Enter:

```
probe-scsi
```

The program displays a message that is similar to the following:

LiD	HA	LUN	---	Port	WWN	---	-----Disk description	-----
0	0	0		21000004cf72f08f	SEAGATE	ST373405FSUN3660438		
1	1	0		21000004cf721553	SEAGATE	ST373405FSUN3660438		
2	2	0		21000004cf7213ea	SEAGATE	ST373405FSUN3660438		
6	6	0		508002000016b5b1	SUNW	SUNWGS INT FCBPL9224		
3	3	0		21000004cf72114b	SEAGATE	ST373405FSUN3660438		
4	4	0		21000004cf7211ae	SEAGATE	ST373405FSUN3660438		
5	5	0		21000004cf7214a3	SEAGATE	ST373405FSUN3660438		

4. Verify that all of the disk drives are recognized. This example indicates that the system controller has successfully probed the device and that the motherboard is operating correctly.

If the `probe-scsi` test fails to show all of the installed disk drives, you may have to replace the disk drive.

5. When you finish testing, enter the following commands:



**CAUTION:**

If you fail to enter these commands, any reboots that you do in the future will stop at the boot prompt instead of proceeding through the normal boot-up process.

```
setenv auto-boot? true
```

```
boot -r
```

The system reboots.

**Symptom:** The DVD drive fails to respond to commands.

**Solution:** To test the SCSI model DVD drive (V880 only):

1. Enter:

```
/usr/sbin/shutdown -y -i0 -g0
```

The system shuts down.

2. At the `ok` prompt, enter the following commands:

```
setenv auto-boot? false
```

```
reset-all
```

The system resets.

### 3. Enter:

**probe-scsi-all**

The program displays a message that is similar to the following:

```
/pci@8,600000/SUNW,qlc@2
LiD HA LUN --- Port WWN --- -----Disk description -----
0 0 0 21000004cf72f08f SEAGATE ST373405FSUN3660438
1 1 0 21000004cf721553 SEAGATE ST373405FSUN3660438
2 2 0 21000004cf7213ea SEAGATE ST373405FSUN3660438
6 6 0 508002000016b5b1 SUNW SUNWGS INT FCBPL9224
3 3 0 21000004cf72114b SEAGATE ST373405FSUN3660438
4 4 0 21000004cf7211ae SEAGATE ST373405FSUN3660438
5 5 0 21000004cf7214a3 SEAGATE ST373405FSUN3660438

/pci@8,700000/scsi@1
Target 5
Unit 0 Removeable Tape HP C5683A C005
Target 6
Unit 0 Removeable Read Only device TOSHIBA DVD-ROM SD-M14011009
/pci@8,700000/pci@5/SUNW,lsptwo@4
```

### 4. Verify that the DVD drive is recognized. This example shows the default SCSI devices, the tape drive (target 5), and the DVD drive (target 6).

If the test fails to show all of the installed SCSI drives, you may have to replace the drive.

### 5. When you finish testing, enter the following commands:



#### **CAUTION:**

If you fail to enter these commands, any reboots that you do in the future will stop at the boot prompt instead of proceeding through the normal boot-up process.

**setenv auto-boot? true**

**boot -r**

The system reboots.

**Symptom:** The DVD drive fails to respond to commands.

**Solution:** To test the IDE model DVD drive (V890 only):

1. Enter:

```
/usr/sbin/shutdown -y -i0 -g0
```

to shut down the system.

2. At the **ok** prompt, enter the following commands:

```
setenv auto-boot? false
```

```
reset-all
```

The system resets.

3. Enter:

```
probe-ide
```

The program displays a message that is similar to the following:

```
Device 0 ( Primary Master )
      Removeable ATAPI Model: TOSHIBA DVD-ROM SD-M1712

Device 1 ( Primary Slave )
      Not Present
```

4. Fix any obvious errors, such as disconnected cables or external drives without power.
5. When you finish testing, enter the following commands:



**CAUTION:**

If you fail to enter these commands, any reboots that you do in the future will stop at the boot prompt instead of proceeding through the normal boot-up process.

```
setenv auto-boot? true
```

```
boot -r
```

The system reboots.

---

## Troubleshooting tape drives

Use the following procedures to troubleshoot tape drives:

- [Checking tape status](#)
- [Reassigning device instance numbers for tape devices](#) on page 192

---

### Checking tape status

For many procedures, you must identify what tape drive, by device path, you will use for the procedure. Tape drives are assigned to particular device paths, usually one of the following:

- `/dev/rmt/0`
- `/dev/rmt/0c`
- `/dev/rmt/1`
- `/dev/rmt/1c`

**Note:**

The letter *c* at the end of the device name indicates that the tape device can operate in compressed mode. Avaya recommends that you use compressed mode at all times.

To determine what device paths are available on your system:

1. Insert a tape into the tape drive.
2. Enter the following commands:

```
mt -f /dev/rmt/0 status
```

```
mt -f /dev/rmt/1 status
```

If the device path is correct, a message that is similar to the following is displayed:

```
HP DAT-72 tape drive:
sense key(0x0)= Unit Attention      residual= 0    retries= 0
file no= 0    block no= 0
```

If the device path is incorrect, a message that is similar to the following is displayed:

```
/dev/rmt/0c: No such file or directory
```

If there is no tape in the tape drive, a message that is similar to the following is displayed:

```
/dev/rmt/0c: No tape loaded or drive offline
```

If the tape drive is busy, a message that is similar to the following is displayed:

```
/dev/rmt/0c: Device busy
```

---

## Reassigning device instance numbers for tape devices

As tape drives are added to and removed from a system, the device instance numbers can get out of sequence with the number of tape drives. For example, if a system has two tape drives, and one is removed, the system may accidentally try to use a tape drive that no longer exists.

To reassign device instance numbers for tape devices:

1. Log in to the system as root.
2. Make sure that the target addresses for any SCSI tape drives are set correctly.  
Typically, the internal tape drive is SCSI address 5, and an external tape drive is SCSI address 4. If you change the SCSI address, you must turn the tape drive power off and back on.
3. Insert the Solaris software disk into the DVD drive.
4. After about 15 seconds, enter the following commands:

```
boot cdrom -sw
```

```
fsck -y /dev/dsk/c1t0d0s0
```

```
mount /dev/dsk/c1t0d0s0 /a
```

```
devfsadm -vCc tape -r /a -p /a/etc/path_to_inst
```

This reassigns the device instance numbers for the tape devices.

5. Enter:

```
eject cdrom
```

6. Remove the Solaris software disk.



---

## Recovery procedures

This section provides solutions for the following problems:

- [Preserving data after a system failure](#) on page 193
- [Loss of power](#) on page 194
- [Probe command warnings](#) on page 196
- [Reseating HSI/P cards \(R3V11 and V880 only\)](#) on page 197
- [Resetting a device alias](#) on page 198
- [Remote console port problems](#) on page 200

---

### Preserving data after a system failure

Enter the **sync** command at the **ok** prompt to force any information on its way to the hard disk to be written out immediately. This command is useful if the operating system fails or is interrupted before preserving all data.

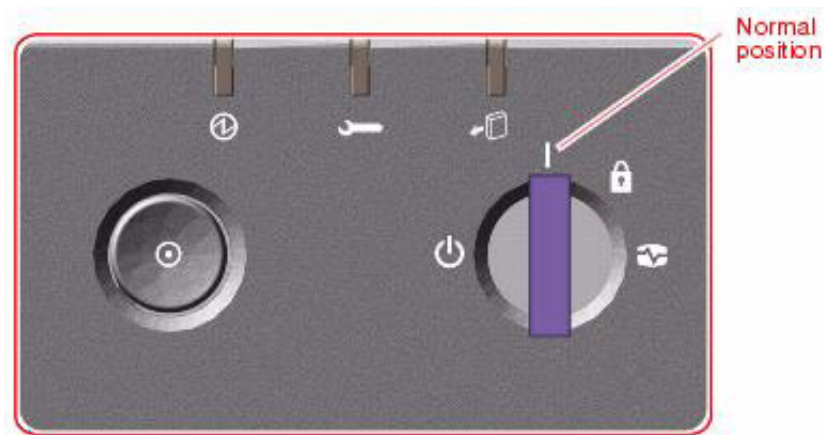
The **sync** command returns control to the operating system and performs the data-saving operations. After the disk data is synchronized, the operating system begins to save a core image of itself. If you do not need this core dump, you can interrupt the operation by pressing **Stop+A**.

## Loss of power

If the system loses power, it is recommended (but not required) that you empty the DVD-ROM and tape drives. The system boots from the hard disk drive by default.

### Turning on the computer

1. Turn on any external SCSI devices, starting with the device that is farthest from the system and working toward the system.
2. Turn on the system monitor.
3. Turn the key switch to the On position. See the following figure.



4. Press and release the power button to the left of the key switch to turn on the system.

**Note:**

The POST diagnostics occurs each time that you turn on the system. The POST tests the basic system components. This may take several minutes.

If the system is operating properly, a banner screen is displayed up to 3 minutes after it is turned on.

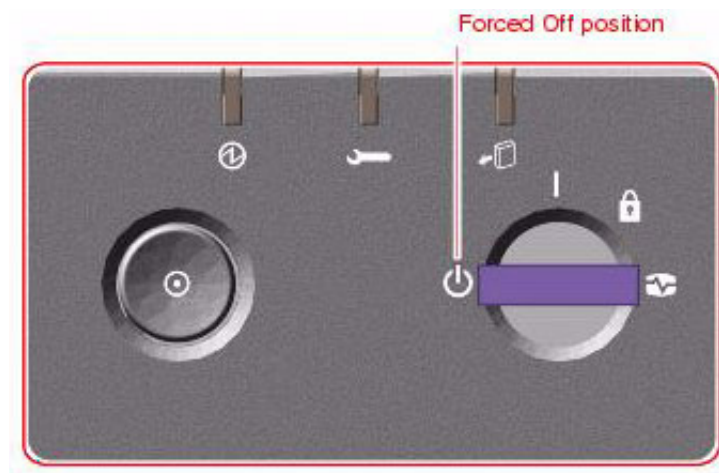
```
|-----| Sun Fire XXX, Keyboard Present
|       | Copyright 1998-2001 Sun Microsystems, Inc. All rights reserved.
|       | OpenBoot X.X, XXX MB memory installed, Serial #XXXXXXXXXX
|-----| Ethernet address X:X:XX:XX:XX:XX, Host ID: XXXXXXXXX
```

## Turning off the computer

1. Log in to the system as root.
2. Enter:  

```
/usr/sbin/shutdown -y -i0 -g0
```

This shuts down the system.
3. Press and release the front panel power button to turn off the system.  
Wait for the front panel Power/OK LED to turn off.
4. Turn the key switch to the Forced Off position. See the following figure.



### **DANGER:**

Be sure to turn the key switch to the Forced Off position before handling any internal components. Otherwise, it is possible for a user to restart the system remotely while you are working inside it. The Forced Off position is the only key switch position that prevents an RSC user from restarting the system.

5. Turn off the system monitor.
6. Turn off any external SCSI devices, starting with the device that is closest to the system and working toward the farthest device.

---

## Probe command warnings

**Symptom:** When running any of the **probe** commands, the following message is displayed:

```
This command may hang the system if a Stop-A or halt command has been executed. Please
type reset-all to reset the system before executing this command. Do you wish to
continue [Y/N].
```



**CAUTION:**

Do not continue. Answer **n**. Do not answer **y**.

**Solution:** To recover from this condition:

1. Enter: **n**

This stops the **probe** command.

2. Enter the following commands:

```
setenv auto-boot? false
```

```
reset-all
```

3. It is now safe to run any of the **probe** commands and perform any other boot PROM-level diagnostics.
4. After you finish probing the system devices, enter the following commands:



**CAUTION:**

If you fail to enter these commands, any reboots that you do in the future will stop at the boot prompt instead of proceeding through the normal boot-up process.

```
setenv auto-boot? true
```

```
boot -r
```

The system reboots.

## Reseating HSI/P cards (R3V11 and V880 only)

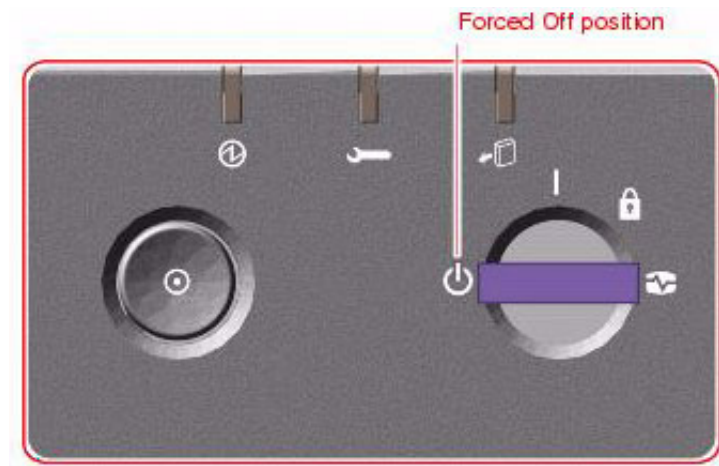
The HSI/P cards may appear to be faulty when they just need to be reseated in the PCI slot. Before you replace the card, try reseating the card.

To reseat an HSI/P card:

1. Log in to the system as root.
2. Enter:  

```
/usr/sbin/shutdown -y -i0 -g0
```

This shuts down the system.
3. Press and release the front panel power button to turn off the system.  
Wait for the front panel Power/OK LED to turn off.
4. Turn the key switch to the Forced Off position. See the following figure.



### **DANGER:**

Be sure to turn the key switch to the Forced Off position before handling any internal components. Otherwise, it is possible for a user to restart the system remotely while you are working inside it. The Forced Off position is the only key switch position that prevents an RSC user from restarting the system.

5. Open the left door.
6. Attach one end of an ESD antistatic wrist strap to the system chassis sheet metal and attach the other end to your wrist. See [Using an ESD wrist strap](#) on page 59 for more information.
7. Disconnect the HSI/P quad cable connected to the card.
8. Carefully pull the card from the I/O board.

9. Reinsert the HSI/P card into the slot on the I/O board. Make sure that the card is fully seated.
10. Rotate the purple PCI retaining clip over the back of the card faceplate until it snaps into place.
11. Remove the ESD wrist strap.
12. Close the left door.
13. Reattach the HSI/P quad cable.
14. Turn on any external SCSI devices, starting with the device that is farthest from the system and working toward the system.
15. Turn on the system monitor.
16. Turn on the system. Do *not* put the key switch in the locked position.
17. When the system comes back up, log in as root.
18. Test the card to see if it is now working. If the card is still not working, see [Replacing an HSI/P card](#) on page 83.

---

## Resetting a device alias

If a boot disk is replaced, or if the NVRAM chip is ever reset permanently to the Sun factory defaults, the boot disk and EEPROM values must be reset to the Avaya factory defaults. This can happen when any of the following occurs:

- The NVRAM chip has been replaced
- The `set-defaults` or `setenv use-nvramrc? false` command is run
- A PROM patch is applied

To reset the NVRAM to bootable options for the boot disks:

1. At the `ok` prompt, enter:

```
show-disks
```

The disk devices are displayed.

2. Select the letter for the proper boot device. For example:

```
/pci@8,600000/SUNW,q1c@2/fp@0,0/disk
```

This copies the boot device string into the editor clipboard.

3. Enter:

```
nvalias disk Ctrl+Y (that is, press and hold the Ctrl key and the y key)
```

4. Add @0,0 at the end of the line as shown in the following example:

```
nvalias disk /pci@8,600000/SUNW,qlc@2/fp@0,0/disk@0,0
```

Adding the @0,0 gives the command the target and slice of the primary boot device.

5. If needed, repeat the above procedure for the boot drive on a mirrored system using **bootdevice2** as your mirror boot device alias, as shown in the following example:

```
nvalias bootdevice2 /pci@8,600000/SUNW,qlc@2/fp@0,0/disk@3,0
```

Adding the @3,0 gives the command the target and slice of the mirror boot device.

6. Enter:

```
devalias
```

The device aliases are displayed. Verify that **disk** and **bootdevice2** are set to the correct alias values.

7. Enter:

```
setenv boot-device disk bootdevice2
```

8. Enter:

```
reset-all
```

The system resets and boots up to the operating system.

9. After setting the disk device alias, check the EEPROM values as described in "Displaying and setting the EEPROM parameters" of the CMS software installation, maintenance, and troubleshooting document for your CMS release. Reset any values that do not match the values described in that section.

---

## Remote console port problems

This section contains problems you may encounter with the remote console port.

**Symptom:** The remote console port will not initialize for dialing in or dialing out.

**Solution:** To correct this problem:

1. Enter:

```
sacadm -l
```

If the system status reports **NO\_SAC**, the port is not working properly.

2. Enter:

```
/cms/install/bin/abcadm -i -b 9600 ttya
```

The following message should be displayed:

```
ttya set to incoming port 9600 baud
```

If this message is not displayed, continue with Step 3.

3. Enter:

```
/cms/install/bin/abcadm -r ttya
```

The following message is displayed:

```
ttya is currently set to be incoming
Are you sure you want to change it? [y,n,?]
```

4. Enter: **y**

The following message is displayed:

```
ttya administration removed
```

The port monitor turns off.

5. Enter:

```
ps -ef | grep sac
```

This finds any SAC processes that are running. If any processes are found, continue with Step 6. Otherwise, continue with Step 7.

6. Enter:

```
kill -9 <pid>
```

Use this command to kill any SAC processes still running. Process numbers are represented by **<pid>**.



7. Enter:

```
/usr/lib/saf/sac -t 300
```

This restarts SAC.

8. Enter:

```
sacadm -l
```

Confirm that SAC is running. The system should report the port status as **ENABLED**.

9. Enter:

```
/cms/install/bin/abcadm -i -b 9600 ttya
```

The following message should be displayed:

```
ttya set to incoming port 9600 baud
```

If this message is not displayed, escalate the problem using the normal channels.

**Symptom:** The system cannot dial out to report alarms using the Alarm Origination Manager (AOM).

**Solution:** To correct this problem:

1. Enter:

```
tail /etc/uucp/Devices
```

The system should display the following:

```
ACU cua/b - Any Hayes
Direct cua/a - Any Direct
Direct cua/b - Any Direct
```

2. Check the settings on the remote console modem. For the U.S. Robotics modem, make sure that DIP switches 4 and 8 are down (ON). If these switches are not set correctly, you may still be able to dial in, but it may not dial out.
3. Enter:

```
/opt/cc/install/aot.cssrXXXX.x/bin/setup
```

This restarts AOM. The release number **XXXX.x** depends on your installation.

To send a test alarm:

1. Enter the following commands to set up the test environment:

```
. /opt/cc/aot/bin/aom_env
```

```
cd /opt/cc/aot/bin
```

```
aom start
```

```
export PRODUCT_TYPE=TEST
```

2. Enter:

```
./log_error -e 30001 -d "test alarm"
```

This sends a test alarm.

3. Enter:

```
./alarm_view -p TEST -a TEST_ALARM
```

This will display the test alarm.

4. Enter:

```
./alarm_resolve -p TEST -a TEST_ALARM
```

This resolves the test alarm.

5. Enter:

```
tail -f aom_log
```

The AOM log file is displayed.

6. If you change an AOM parameter, such as the product ID or the telephone number, you must turn AOM off and back on again to recognize the new parameters. These parameters are in `/opt/cc/aot/data/admin/sysSetup.cfg` file. Be sure to set the port to value 1 for ttya.

7. If the `/opt/cc/aom/data/log` file has the message "aom cms alarm is disabled", enter:

```
export PRODUCT_TYPE=TEST
```

This enables the alarm.

# Glossary

<b>Automatic Call Distribution (ACD)</b>	<p>A switch feature. ACD is software that channels high-volume incoming call traffic to agent groups (splits or skills).</p> <p>Also an agent state where the extension is engaged in an ACD call (with the agent either talking to the caller or the call waiting on hold).</p>
<b>Boot disk</b>	A disk that contains the Solaris operating system and customer data.
<b>CMS</b>	Call Management System (CMS). A software product used by business customers that have an Avaya telecommunications switch and receive a large volume of telephone calls that are processed through the Automatic Call Distribution (ACD) feature of the switch.
<b>Data disk</b>	A nonbootable disk. A data disk contains only customer data.
<b>FC-AL</b>	Fiber channel arbitrated loop. This is the loop device that controls the disk drives.
<b>High Speed Serial Interface/PCI (HSI/P)</b>	The HSI/P controller card is a 4-port serial communications PCI card. Each of the four ports is used for a single physical X.25 link. It is an add-on package that is needed by CMS for multiple ACDs.
<b>Non-volatile random access memory (NVRAM)</b>	A random access memory (RAM) system that holds its contents when external power is lost.
<b>RSC</b>	Remote System Control
<b>Solaris</b>	The operating system package on the Sun computer. Solaris is a version of the UNIX System V Release 4. CMS requires Solaris to run on the Sun computers.
<b>SSO</b>	Services Support Organization. The Avaya organization that provides technical support for Avaya products.
<b>TPE</b>	Twisted-pair Ethernet



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